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PROCEEDINGS

OF THE

American Pharmaceutical Association

AT THE

THIRTY-SIXTH ANNUAL MEETING,

HELD AT DETROIT, MICH., SEPTEMBER, 1888.

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

PHILADELPHIA:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1888.

OFFICERS OF THE ASSOCIATION.

1888-89.

PRESIDENT.

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REPORTER ON PROGRESS OF PHARMACY.

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And the following representatives of State (or District) Pharmaceutical Associations :

Alabama.	Philip C. Candidus, Mobile.
Arkansas.	Jas. E. Gibson, Little Rock.
California.	To be appointed.
Columbia, Dist.	H. E. Kalusowski, Washington.
Connecticut.	Chas. A. Rapelye, Hartford.
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Dakota, South.	G. W. Lowry, Sioux Falls.
Delaware.	Linton Smith, Wilmington.
Florida.	J. M. Dixon, Titusville.
Georgia.	Geo. D. Case, Milledgeville.
Illinois.	R. E. Rhode, Chicago.
Indiana.	G. W. Sloan, Indianapolis.
Iowa.	Geo. H. Schafer, Fort Madison.
Kansas.	Lucius E. Sayre, Lawrence.
Kentucky.	Edward Goebel, Louisville.
Louisiana.	R. N. Girling, New Orleans.
Maine.	N. S. Harlow, Bangor.
Maryland.	Chas. Caspari, Jr., Baltimore.
Massachusetts.	Wm. W. Bartlet, Boston.
Michigan.	A. B. Stevens, Ann Arbor.
Minnesota.	F. F. Stark, Minneapolis.
Mississippi.	Jos. W. Eckford, Aberdeen.
Missouri.	J. M. Love, Kansas City.
Nebraska.	Chas. L. Mullen, Manley.
New Hampshire.	M. S. Woodman, West Lebanon.
New Jersey.	Chas. B. Smith, Newark.
New York.	C. S. Ingraham, Elmira.
North Carolina.	E. V. Zoeller, Tarboro.
Ohio.	J. A. Nipgen, Chillicothe.
Pennsylvania.	Chas. T. George, Harrisburg.
Rhode Island.	E. A. Calder, Providence.
South Carolina.	Chas. F. Panknin, Charleston.
Tennessee.	James O. Burge, Nashville.
Texas.	E. M. Wells, Fort Worth.
Virginia.	Hugh Blair, Richmond.
West Virginia.	Edwin L. Boggs, Charleston.
Wisconsin.	A. Conrath, Milwaukee.
Quebec.	Joseph Contant, Montreal.
Ontario.	To be appointed.

SPECIAL COMMITTEE OF SECTION ON PHARMACEUTICAL EDUCATION, TO REPORT ON STANDARD OF PRELIMINARY EXAMINATION.

WILLIAM M. SEARBY (Chairman) . . . . San Francisco, Cal.
A. B. STEVENS, Ann Arbor, Mich.
J. M. MAISCH, Philadelphia.

SPECIAL COMMITTEE OF SECTION ON PHARMACEUTICAL LEGISLATION, TO REPORT OUTLINE PLAN FOR INTERCHANGE OF CERTIFICATES BY BOARDS OF PHARMACY.

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GEORGE MCDONALD, Kalamazoo, Mich.
CHAS. M. FORD, Denver, Col.
JOHN A. NIPGEN, Chillicothe, O.
ROBT. O. SWEENEY, St. Paul, Minn.

COUNCIL.

MEMBERS OF THE COUNCIL.

Term expires.		
1889.	The Officers of the Association, *ex-officio:*	
"	Philip C. Candidus	Mobile, Ala.
"	George W. Kennedy	Pottsville, Pa.
"	Albert H. Hollister	Madison, Wis.
1890.	James M. Good	St. Louis, Mo.
"	Lewis C. Hopp	Cleveland, O.
"	William Dupont	Detroit, Mich.
1891.	Henry Canning	Boston, Mass.
"	Emlen Painter	New York, N. Y.
"	Christian L. Keppler	New Orleans, La.

OFFICERS OF THE COUNCIL.

James M. Good (Chairman). Emlen Painter, Vice-Chairman.

George W. Kennedy, Secretary.

COMMITTEES OF THE COUNCIL.

On Membership: Albert H. Hollister, Chairman.
M. W. Alexander,
C. L. Keppler,
Philip C. Candidus,
A. A. Yeager,
The Treasurer and Permanent Secretary of the Association, *ex-officio.*

On Finance: Wm. Dupont, Chairman,
James Vernor,
Fred. Wilcox,

On Publication: C. Lewis Diehl, Chairman,
Lewis C. Hopp,
Fred. Wilcox,
Henry Canning,
John M. Maisch.

On Centennial Fund: Maurice W. Alexander, Chairman,
William Dupont,
John M. Maisch.

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.

(DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852 .	Philadelphia, Pa . .	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	Samuel M. Colcord, Boston.	*C. Augustus Smith*, Cincinnati.
Aug. 24, 1853 .	Boston, Mass. . . .	William A. Brewer, Boston.	George D. Coggeshall, New York.	*Alexander Duval*, Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854 .	Cincinnati, O . . .	*William B. Chapman*, Cincinnati.	Henry T. Cummings, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855 .	New York, N. Y . .	*John Meakim*, New York.	Charles B. Guthrie, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856 .	Baltimore, Md . . .	*George W. Andrews*, Baltimore.	*John L. Kidwell*, Washington, D. C.	Frederick Stearns, Detroit, Mich.	*Henry T. Kiersted*, New York.
Sept. 8, 1857 .	Philadelphia, Pa . .	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburg, Va.	*Samuel P. Peck*, Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858 .	Washington, D. C .	*John L. Kidwell*, Georgetown, D. C.	Edward R. Squibb, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859 .	Boston, Mass . . .	Samuel M. Colcord, Boston.	*William Procter, Jr.*, Philadelphia.	*Joseph Roberts*, Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860 .	New York, N. Y . .	*Henry T. Kiersted*, New York.	William J. M. Gordon, Cincinnati.	William S. Thompson, Baltimore.	Theodore Metcalf, Boston.
Aug. 27, 1862 .	Philadelphia, Pa . .	*William Procter, Jr.*, Philadelphia.	*John Milhau*, New York,	*Eugene L. Massot*, St. Louis.	*J. Faris Moore*, Baltimore.
Sept. 8, 1863 .	Baltimore, Md . . .	*J. Faris Moore*, Baltimore.	John M. Maisch, Philadelphia.	Chas. A. Tufts, Dover, N. H.	*George W. Weyman*, Pittsburgh.

LIST OF OFFICERS. (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 21, 1864 .	Cincinnati, O . . .	William J. M. Gordon, Cincinnati.	*Richard H. Stabler*, Alexandria, Va.	Enno Sander, St. Louis.	*Thomas Hollis*, Boston.
Sept. 5, 1865 .	Boston, Mass . . .	*Henry W. Lincoln*, Boston.	George C. Close, Brooklyn, N. Y.	*Elijah W. Sackrider*, Cleveland, O.	Charles A. Heinitsh, Lancaster, Pa.
Aug. 22, 1866 .	Detroit, Mich . . .	Frederick Stearns, Detroit, Mich.	*Edward Parrish*, Philadelphia.	Ezekiel H. Sargent, Chicago.	*John W. Shedden*, New York.
Sept. 10, 1867 .	New York	*John Milhau*, New York.	Robert J. Brown, Leavenworth, Kan.	N. Hynson Jennings, Baltimore.	*Daniel Henchman*, Boston.
Sept. 8, 1868 .	Philadelphia, Pa . .	*Edward Parrish*, Philadelphia.	*Ferris Bringhurst*, Wilmington, Del.	*Edward S. Wayne*, Cincinnati.	Albert E. Ebert, Chicago.
Sept. 7, 1869 .	Chicago, Ill	Ezekiel H. Sargent, Chicago.	Ferdinand W. Sennewald, St. Louis.	John H. Pope, New Orleans.	Joel S. Orne, Cambridgeport, Mass.
Sept. 13, 1870 .	Baltimore, Md . . .	*Richard H. Stabler*, Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	James G. Steele, San Francisco.	*Eugene L. Massot*, St. Louis.
Sept. 12, 1871 .	St. Louis, Mo . . .	Enno Sander, St. Louis.	C. Lewis Diehl, Louisville, Ky.	George F. H. Markoe, Boston.	Matthew F. Ash, Jackson, Miss.
Sept. 3, 1872 .	Cleveland, O . . .	Albert E. Ebert, Chicago.	Samuel S. Garrigues, East Saginaw, Mich.	Edward P. Nichols, Newark, N. J.	Henry C. Gaylord, Cleveland, O.
Sept. 16, 1873 .	Richmond, Va . . .	John F. Hancock, Baltimore.	William Saunders, London, Ont.	John T. Buck, Jackson, Miss.	Paul Balluff, New York.
Sept. 8, 1874 .	Louisville, Ky . . .	C. Lewis Diehl, Louisville, Ky.	*Joseph Roberts*, Baltimore.	William T. Wenzell, San Francisco.	Augustus R. Bayley, Cambridgeport, Mass.
Sept. 7, 1875 .	Boston, Mass . . .	George F. H. Markoe, Boston.	Frederick Hoffmann, New York.	T. Roberts Baker, Richmond, Va.	Christian F. G. Meyer, St. Louis.
Sept. 12, 1876 .	Philadelphia, Pa . .	Charles Bullock, Philadelphia.	Samuel A. D. Sheppard, Boston.	*Gustavus J. Luhn*, Charleston, S. C.	Jacob D. Wells, Cincinnati.

Sept. 4, 1877 .	Toronto, Can. . . .	William Saunders, London, Ont.	Ewen McIntyre, New York.	John Ingalls, Macon, Ga.	Emlen Painter, San Francisco.
Nov. 26, 1878 .	Atlanta, Ga	*Gustavus J. Luhn*, Charleston, S. C.	Frederick T. Whiting, Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	*William H. Crawford*, St. Louis.
Sept. 9, 1879 .	Indianapolis, Ind. .	George W. Sloan, Indianapolis, Ind.	T. Roberts Baker, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880 .	Saratoga, N. Y. . .	James T. Shinn, Philadelphia.	George H. Schafer, Fort Madison, Ia.	William S. Thompson, Washington.	William Simpson, Raleigh, N. C.
Aug. 23, 1881 .	Kansas City, Mo . .	P. Wendover Bedford, New York.	Emlen Painter, San Francisco.	George Leis, Lawrence, Kan.	John F. Judge, Cincinnati.
Sept. 12, 1882 .	Niagara Falls, N. Y.	Charles A. Heinitsh, Lancaster, Pa.	John Ingalls, Macon, Ga.	Louis Dohme, Baltimore.	William B. Blanding, Providence, R. I.
Sept. 11, 1883 .	Washington, D. C .	William S. Thompson, Washington, D. C.	Charles Rice, New York.	Frederick H. Masi, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884 .	Milwaukee, Wis . .	John Ingalls, Macon, Ga.	John A. Dadd, Milwaukee, Wis.	Henry Canning, Boston, Mass.	Charles F. Goodman, Omaha, Neb.
Sept. 8, 1885 .	Pittsburgh, Pa . . .	*Joseph Roberts*, Baltimore, Md.	Albert H. Hollister, Madison, Wis.	Albert B. Prescott, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886 .	Providence, R. I . .	Chas. A. Tufts, Dover, N. H.	Henry J. Menninger, Brooklyn, N. Y.	M. W. Alexander, St. Louis, Mo.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887	Cincinnati, O. . . .	John U. Lloyd, Cincinnati, O.	M. W. Alexander, St. Louis, Mo.	A. K. Finlay, New Orleans, La.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888 .	Detroit, Mich . . .	M. W. Alexander, St. Louis, Mo.	Jas. Vernor, Detroit, Mich.	Fred. Wilcox, Waterbury, Conn.	Alvin A. Yeager, Knoxville, Tenn.
June 24, 1889 .	San Francisco, Cal .				

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852–54.
Samuel M. Colcord, Boston, 1854–56, and 1857–59.
James S. Aspinwall, New York, 1856–57.
Ashel Boyden, Boston, 1859–60.
Henry Haviland, New York, 1860–63.
J. Brown Baxley, Baltimore, 1863–65.
Charles A. Tufts, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–89.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852–53.
Edward Parrish, Philadelphia, 1853–54.
Edward S. Wayne, Cincinnati, 1854–55.
William J. M. Gordon, Cincinnati, 1855–59.
Charles Bullock, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.
Peter W. Bedford, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.
John M. Maisch, Philadelphia, 1865–89.

CORRESPONDING SECRETARIES.

William Procter, Jr., Philadelphia, 1852–53, and 1854–57.
William B. Chapman, Cincinnati, 1853–54.
Edward Parrish, Philadelphia, 1857–58.
Ambrose Smith, Philadelphia, 1858–59.
William Hegeman, New York, 1859–60.
Peter W. Bedford, New York, 1860–62, and 1863–66.
John M. Maisch, Philadelphia, 1862–63.

LOCAL SECRETARIES.

For the meeting held in	
1867	P. Wendover Bedford.
1868	Alfred B. Taylor.
1869	Henry W. Fuller.
1870	*J. Faris Moore.*
1871	*William H. Crawford.*
1872	Henry C. Gaylord.
1873	Thomas H. Hazard.
1874	Emil Scheffer.
1875	Samuel A. D. Sheppard.
1876	Adolphus W. Miller.
1877	Henry J. Rose.
1878	Jesse W. Rankin.
1879	Eli Lilly.
1880	Charles F. Fish.
1881	William T. Ford.
1882	*Hiram E. Griffith.*
1883	Charles Becker.
1884	Henry C. Schranck.
1885	George A. Kelly.
1886	William B. Blanding.
1887	George W. Voss.
1888	James Vernor.
1889	Edward W. Runyon.

REPORTER ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873–89.

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

Alabama,	P. C. Candidus,	Mobile.
Arkansas,	Geo. W. Cabell, Congress and Bull streets,	Hot Springs.
	John B. Eond, Main and 5th streets,	Little Rock.
California,	William T. Wenzell, 532 Market street,	San Francisco.
Colorado,		Denver.
Dist. of Columbia,	John A. Milburn, 1120 Thirteenth St., N. W.,	Washington.
Connecticut,	John K. Williams, 391 Main street,	Hartford.
	Warren A. Spalding, 19 Church street,	New Haven.
	Luzerne I. Munson, Apothecaries' Hall,	Waterbury.
Delaware,	Linton Smith, cor. Church and Bennett streets,	Wilmington.
Georgia,	Theo. Schumann, Whitehall and Hunter streets,	Atlanta.
	Robert H. Land, 812 Broad street,	Augusta.
	John Ingalls, cor. Fourth and Poplar streets,	Macon.
Illinois,	C. S. N. Hallberg, 69 Dearborn street,	Chicago.
	David G. Plummer, 6 Main street,	Bradford.
	Charles Zimmermann, 423 S. Adams street,	Peoria.
Indiana,	Henry J. Schlæpfer, Second and Main streets,	Evansville.
	George W. Sloan, 304 N. Meridian street,	Indianapolis.
	David Hilt, 84 Main street,	Lafayette.
	William C. Buntin, 600 Main street,	Terre Haute.
Iowa,	John W. Ballard, 106 West Second street,	Davenport.

	Theodore W. Ruete, 379 Main street,	Dubuque.
	George H. Schafer, 129 Front street,	Fort Madison.
	Silas H. Moore, 80 Fourth street,	Sioux City.
Kansas,	George Leis, 90 Massachusetts street,	Lawrence.
	Robert J. Brown, 113 Delaware street,	Leavenworth.
Kentucky,	George A Zwick, Eleventh street and Madison avenue,	Covington.
	William H. Averill, 435 Main street,	Frankfort.
	C. Lewis Diehl, cor. Third and Broadway,	Louisville.
Louisiana,	Alexander K. Finlay, 186 Camp street,	New Orleans.
	Joseph T. Thibodeaux, Main street,	Thibodaux.
Maine,	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edmund Dana, Jr., 373 Congress street,	Portland.
Maryland,	D. M. R. Culbreth, Charles and Eager streets,	Baltimore.
	Thomas W. Shryer, 103 Baltimore street,	Cumberland.
Massachusetts,	George M. Hoyt, 210 Columbus avenue,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, 51 Vine street,	Charlestown.
	Frederick T. Whiting, Main street,	Great Barrington.
	Freeman H. Butler, 141 Central street,	Lowell.
	Joseph W. Colcord, 153 Union street,	Lynn.
	James E. Blake, 65 North Second street,	New Bedford.
	Joseph J. Estes, Union and Church streets,	Rockland.
	Thomas B. Nichols, 159 Essex street,	Salem.
	William Bush, 56 Front street,	Worcester.
Michigan,	Ottmar Eberbach, 12 South Main street,	Ann Arbor.
	James Vernor, 235 Woodward avenue,	Detroit.
	Henry Melchers, Genesee and Jefferson streets,	East Saginaw.
	Jacob Jesson, Western avenue and Jefferson street,	Muskegon.
Minnesota,	Karl Simmon, Third and Market streets,	St. Paul.
Mississippi,	Joseph W. Eckford, Commerce street,	Aberdeen.
	Matthew F. Ash,	Jackson.
Missouri,	William T. Ford, 1305 Cherry street,	Kansas City.
	James M. Good, 2348 Olive street,	St. Louis.
Nebraska,	Charles F. Goodman, 180 Farnham street,	Omaha.
Nevada,	William A. Perkins, 213 Main street,	Virginia City.
New Hampshire,	E. S. Russell, 69 Main street,	Nashua.
New Jersey,	Albert P. Brown, 5th and Federal streets,	Camden.
	Jonathan B. Drake, 132 Broad street,	Elizabeth.
	Hermann Klussmann, Fourth street and Lafayette avenue,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue,	Jersey City.
	Charles B. Smith, 831 Broad street,	Newark.
	Howard P. Reynolds, Park and North aves.,	Plainfield.
New York,	Charles H. Gaus, 202 Washington avenue,	Albany.
	G. C. Close, 67 Cumberland street,	Brooklyn.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. Dubois, 281 Main street,	Catskill.

	John Hepburn, 103 Main street,	Flushing.
	Harvey G. Goodale, P. O. Box 29,	Jamaica.
	James T. King, cor. Main and South streets,	Middletown.
	John McKesson, Jr., 91 Fulton street,	New York.
	G. H. Haass, 105 East Main street,	Rochester.
	John G. Bissell, 45 Dominick street,	Rome.
	Charles F. Fish, 114 Broadway,	Saratoga.
	Willis T. Hanson, 195 State street,	Schenectady.
	Charles W. Snow, 28 East Genesee street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
North Carolina,	Samuel J. Hinsdale, Market Square,	Fayetteville.
	William Simpson, 33 Fayetteville street,	Raleigh.
	John H. Hardin, 124 South Front street,	Wilmington.
Ohio,	Andrew M. Armstrong, 106 East Market street,	Akron.
	Walter H. Howson, Water and Walnut sts.,	Chillicothe.
	J. U. Lloyd, Court and Plum streets,	Cincinnati.
	George H. Hechler, 1099 Broadway street,	Cleveland.
	Charles Huston, 43 South High street,	Columbus.
	Otto S. Weusthoff, 218 East 3d street,	Dayton.
	Thomas J. Casper, 41 East Main street,	Springfield.
	Charles Hohley, 248 South street,	Toledo.
	Edgar M. Hatton, Fifth and Main streets,	Zanesville.
Pennsylvania,	Jacob A. Miller, cor. Second and Chestnut streets,	Harrisburg.
	Charles A. Heinitsh, 16 East King street,	Lancaster.
	Joseph L. Lemberger, 8 North Ninth street,	Lebanon.
	Rich. M. Shoemaker, cor. Fourth and Race streets,	Philadelphia.
	George A. Kelly, 101 Wood street,	Pittsburgh.
	Philip M. Ziegler, 526 Penn street,	Reading.
	John M. McNeil, Broadway,	Scottdale.
	Edward A. Cornell, Tenth and Pine streets,	Williamsport.
Rhode Island,	James H. Taylor, 104 Thomas street,	Newport.
	Wm. K. Reynolds, 254 Friendship street,	Providence.
South Carolina,	Charles F. Panknin, 181 Meeting street,	Charleston.
Tennessee,	Jas. S. Robinson, Third and Madison streets,	Memphis.
	John C. Wharton, 38 Union street,	Nashville.
Texas,	Thomas W. Powell, 10 Houston street,	Fort Worth.
Vermont,	Geo. A. Crossman, 2 Simonds Block,	Brandon.
Virginia,	Frederick H. Masi, cor. Main and Granby,	Norfolk.
	T. Roberts Baker, 919 East Main street,	Richmond.
Washington Ter'y,	Henry E. Holmes, 19 Main street,	Walla Walla.
West Virginia,	Edwin L. Boggs, Kanawha Bank Building,	Charleston.
	Edmund Bocking, 1 Odd Fellows' Hall,	Wheeling.
Wisconsin,	John R. Drake, 365 East Water street,	Milwaukee.
	Albert H. Hollister, 25 Pinckney street,	Madison.
Prov. Nova Scotia,	Francis C. Simson,	Halifax.
Prov. Ontario,	John Lowden, 18 DeBreseles street,	Toronto.
Prov. Quebec,	Henry R. Gray, 144 St. Lawrence Main street,	Montreal.

LIST OF QUERIES.

THIRTY-SEVENTH ANNUAL MEETING TO BE HELD IN SAN FRANCISCO, CAL., 1889.

1. A Pharmaceutical comparison of the extracts of Acacia Catechu and Uncaria Gambier. As " Catechu" the U. S. P. directs the extract of Acacia Catechu; the Br. P. directs extracts of Uncaria Gambier. Which of the two is preferable for pharmaceutical uses?

2. Is it feasible to improve the syrups in the Pharmacopœia? An essay on the subject is desired, with practical suggestions for improvement, particularly for Syrupus Aurantii Corticis, Syr. Tolutana, Syr. Zingiberis, Syr. Rhei, Syr. Rhei Aromaticus, Syr. Sarsaparillæ Compositus.

3. Is it desirable and practicable to abolish the present Tinctures and Fluid Extracts of the Pharmacopœia, and to establish in their stead a single class of preparations styled inctures, of uniform strength, and of 50 per cent. of drug value, or of such proportion as can be exhausted by the combined process of maceration and percolation without subsequent concentration? *

4. Is it not advisable to drop from the United States Pharmacopœia all compound galenical preparations?

5. Further researches on the alkaloids of Gelsemium. Is the alkaloid *Gelsemine* the only constituent of the drug having medicinal value? *

6. What is the quality of Belladonna Root as obtained through reliable dealers? How does it compare with Belladonna Leaves in regard to uniformity in strength? *

7. What is the natural combination or association of the alkaloids and resinous constituents of Veratrum Viride?

8. Further researches on the crystalline precipitate that occurs in Tincture of White Agaric.*

9. Do pharmacists generally follow the Pharmacopœia in the preparation of Tincture of Nux Vomica? What bearing, if any, has the result of this inquiry upon introducing into the Pharmacopœia assay methods in other processes? *

10. What is the influence of heat and moisture as a preparatory step in the extraction of some drugs? *

11. It has been proposed to introdoce into the next United States Pharmacopœia processes of assay for such drugs and their preparations (besides those already thus provided for in the last revision), as contain important active principles which may be estimated quantitatively. It being important that the method of assay shall be as simple, concise, and as free from refined technicalities as possible, it is desired that the text for working processes of a series of these drugs be drawn up so that it may be thoroughly tested in advance of the appearance of the work.

12. Colchicum seed contains a fixed oil which renders its alcoholic preparations un-

sightly. Has this oil any medicinal value? If not, can it be removed without detriment to the preparation? *

13. What amount of the drug sold in commerce under the name of Berberis Aquifolium is of the other species of Berberis. *i. e.*, B. Repens and B. Nervosa?

14. What is the comparative value of Yerba Santa, Licorice and Saccharin in masking the taste of Quinine and other bitter substances?

15. It has been asserted that under the name "Hungarian Daisies" an adulterant for Insect Powder has been introduced. To what extent is this adulterant imported?

16. It has been observed that Fluid Extract of Belladonna is a neutral solution when first made, and that by age it acquires an acid reaction. What is the cause of this change, and does it affect the medicinal value of the preparation?

17. Examine some of the more important solid extracts of the market for mineral impurities, chiefly copper, and ascertain the conditions under which this metal may be most accurately estimated, in such cases, by electrolysis.

18. What is the nature of the change which solutions of Morphine salts (notably the muriate) undergo by time, and what is the crystalline body which makes its appearance?

19. How many new albumen products result in pepsin digestion? Can these products be isolated; and by what tests can they be distinguished?

20. Gelatin has been suggested as a superior emulsifying agent for Cod-liver Oil. Can this be verified? If so, give working formula for a permanent emulsion. *

21. Has Syrup of Dextrin a use in pharmacy? Give formula, and instances where it could to advantage replace Cane Sugar Syrup. *

22. A further consideration of Maize Oil. Can it be advantageously employed in pharmacy in place of Cotton Seed Oil or other oils now in use? *

23. What are the present sources of Commerciāl Oil of Wintergreen? and what proportion is derived from each source? Is the synthetical product ever sold as natural oil? To what extent does the artificial Oil of Wintergreen replace the natural oil or oil of birch?

24. Essential Oils are said to be adulterated before reaching the dispenser, to a greater extent than any other medicinal products, and also to materially differ in quality even when pure. What are the best methods of detecting adulterations, and of determining the quality of the principal volatile oils? *

25. It has been stated by competent authorities, that the characteristics aud physical or chemical properties ascribed to many essential oils by the U. S. or other pharmacopœias, often do not fit the commercial oils, even when the latter are known to be genuine. It is desired that as many of the more important officinal essential oils as possible be carefully reëxamined, account being taken of all facts that may be rendered available by those who manufacture and handle these products on a large scale.

26. Complaints have been made that several brands of terebene offered in the market differ but little in physical or medicinal properties from oil of turpentine. Examine all available brands as to their optical properties.

27. Is the reaction of Methozin (Antipyrin) with Spirit of Nitrous Ether, owing to

the free acid present in the spirit? It is said not to react (with coloration at least) with some specimens of Spirit of Nitrous Ether. *

28. What directions should be given in the Pharmacopœias for the care and preservation of Spirit of Nitrous Ether?

29. The officinal method of assaying Spirit of Nitrous Ether having been shown to be unsatisfactory, and better methods having been announced during the last few years, it is very desirable to have drawn up an improved assay process, giving all the details as concisely as possible, but not referring the reader to other works to be consulted. *

30. Acetic Ether of the market varies greatly as to strength and properties. It is desired that experiments be made to ascertain the limit of range of absolute Acetic Ether, and also to determine the nature and proportion of the other constituents.

31. What are the products of the reaction in preparing Decolorized Tincture of Iodine of the National Formulary? To what substance is the peculiar alliaceous odor due which develops in it on standing?

32. Sulphonal, which has acquired some reputation as an efficient hypnotic, is pharmaceutically very intractable. It is desired that working formulæ be devised which will enable its use, if possible, in solution, but at all events in such a manner that absorption will take place more rapidly.

33. A series of very soluble compounds of caffeine have been announced under names similar to those applied to regular double salts, for instance, sodio-cinnamate of caffeine, sodio-benzoate of caffeine, sodio-salicylate of caffeine. Can it be shown whether true double salts of this composition can be prepared? Or can some light be thrown on their constitution?

34. Hypophosphorous Acid has been found to greatly retard, and under certain conditions to entirely prevent the oxidation of ferrous salts to ferric, even when only minute quantities of the acid are present. It is desirable to ascertain: 1. What role the acid bears in this preservative action. 2. What are the limits as to the quantity of acid which will preserve ferrous solutions, and as to the time during which such preservation extends. 3. What becomes of the hypophosphorous acid? 4. Will hypophosphites answer the same purpose? 5. May this preservative agent be used in the case of other chemicals besides ferrous salts?*

35. Solution of Chloride of Iron is declared by the United States Pharmacopœia, when prepared by the officinal process, to have the spec. grav., 1.405. Other authorities state that this figure is scarcely ever reached. Is it possible to so reconstruct the formula that all doubt as to the amount of iron in solution may be eliminated?

36. It has been observed in preparing the Syrup of Citro-iodide of Iron according to the National Formulary, that the solution does not turn green upon adding the Potassium Citrate and Iodine, but after being mixed with the sugar and exposed to the sunlight for a few hours the reddish color is gradually changed to the characteristic green color, which seems to be permanent. What is the reaction that takes place?

37. Should a working formula for "Green Soap" be introduced into the Pharmacopœia, similar to that of the German Pharmacopœia, in order to insure more uniformity?

38. An essay on Corrosive Sublimate as a disinfectant is desired. Do the advantages derived from its use outweigh the disadvantages?

39. In what quantity and to what extent is arsenic present in wall paper? Is the public health thereby in any degree affected?

40. Give a glossary of practically obsolete botanical, chemical and pharmaceutical terms, but such as may still be occasionally met with by pharmacists.

41. Cannot the nomenclature of the Pharmacopœia be improved? A paper is desired on "Pharmacopœial Nomenclature."*

42. What system of weights and measures should be adopted in the next revision of the U. S. Pharmacopœia?

43. With what degree of accuracy are powders ordinarily divided in dispensing?*

44. Do Pharmacists give the public all the protection it should have at their hands, in the way of adulterated, poor and dangerous drugs and preparations?

45. An essay on "How to conduct Quiz Classes" in our pharmaceutical educational institutions?*

46. Is it practical or desirable to have a recognition and interchange of pharmacy certificates by the different State Boards of Pharmacy? and if so, how can this end be accomplished?

47. What should be the true aim of Boards of Pharmacy in their examinations, and how can it be best accomplished?

48. What is the policy of the patent and trade-mark laws in relation to science of medicine and the useful arts of pharmacy and therapy?*

49. It has been asserted on good authority that inventions and discoveries not patented are public property, and that any attempt on the part of an inventor to monopolize his invention, except by means of and the requirements imposed by the patent laws, is an usurpation of public rights. How can the pharmacist be taught that it is his privilege and prerogative to manufacture any and all medicines not patented, and to call them by the names known to the public, all claims to the contrary notwithstanding?

50. Under the present code of ethics of the American Medical Association, can Pharmacists be given creditable recognition as a section in this organization?

51. The membership of the American Pharmaceutical Association is said to comprise but a small proportion of the qualified druggists of America, and even less than five per cent. of the whole number of those engaged in the drug business. What means can be devised to bring about a more liberal representation?

52. Is the college training in Pharmacy after two years practical experience better for the student than the reverse, viz.: theoretical first and practical afterwards?*

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* Accepted.

Note Relative to Original Investigations.—Attention is directed to the CENTENNIAL FUND, the interest of which is to be used for defraying the expenses of suitable investigations (see Chap. VII. of By-Laws of the Council). Those desiring to avail themselves of this fund, may make application to the Permanent Secretary.

To encourage investigations, the "EBERT PRIZE" is offered "for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products; provided, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund" (see Proceedings 1873, page 58).

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PREFATORY NOTICE.

For the present volume it was deemed advisable, solely for the reason of saving expense, to depart from the arrangement adopted since 1874, since which time the Report on the Progress of Pharmacy had precedence in the annual publication. This Report came promptly to hand; but important parts of the minutes, and some of the papers read, could be procured only after considerable correspondence, and the last three of them were received only October 9th, 17th and 18th, respectively, thus delaying the printing, which had been commenced before the close of September. One committee report came to hand as late as November 28th.

The National Formulary having been ordered to be published in the present volume, it was deemed best not to incorporate it with the Proceedings, but to retain for it the same paging and distinct index as in the separate issue, whereby reference would be facilitated.

With the exception of 1856 (out of print), and 1861 (none published), the Proceedings of the Association can still be furnished complete, beginning with the initial meeting in 1851; but of several years only from thirty to forty copies are on hand. The Committee on Publication, thinking that many members would like to complete their sets, has decided to considerably reduce the price of the older volumes, and to offer them, *including postage*, as follows:

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For any more than thirty-two volumes a discount of 60 per cent. on the nbove prices.

The NATIONAL FORMULARY, published by the Association in 1888, is sold at the following prices, including postage: bound in cloth, 75 cents; cloth, interleaved, $1.10; cloth, raised nails (for use in the laboratory), 90 cents; sheep, $1.10; sheep, interleaved, $1.25. For sale by the Authorized Agents of the Association, by wholesale druggists and book sellers.

All orders for Proceedings should be addressed to the Permanent Secretary, John M. Maisch, 143 North Tenth street, Philadelphia, Pa.

The price of the nickel badge has been reduced by vote of the Council to 25 cents, on receipt of which sum by the Permanent Secretary the badge will be sent by mail.

The thirty-seventh annual meeting will be held in the city of San Francisco, California, on the twenty-fourth day of June, 1889, at 3 o'clock, p. m.

Blank forms for recommendations for membership may be obtained from the Permanent Secretary or from the Committee on Membership. Such recommendations should reach the Secretary of the Committee, George W. Kennedy, Pottsville, Pa., at least two weeks before the meeting; if sent later they should be addressed to the care of the Local Secretary, E. W. Runyon, 529 Market street, San Francisco, Cal.

The following schedule has been arranged for holding the sessions at the meeting in San Francisco, allowing three hours or more for each session, without interfering with meals or the requisite recreation:

Session of the Council, Monday 8:30 a. m.
1st session of the Association, Monday 3 p. m., general session.
2d session of the Association, Tuesday 9 a. m., general session.
3d session of the Association, Tuesday 2:30 p. m., 1st session Section on Commercial Interests.
4th session of the Association, Tuesday 8 p. m., 2d session Section on Commercial Interests.
5th session of the Association, Wednesday 9 a. m., 1st session Section on Scientific Papers.
6th session of the Association, Wednesday 2:30 p. m., 2d session Section on Scientific Papers.
7th session of the Association, Thursday 9 a. m., 3d session Section on Scientific Papers.
8th session of the Association, Thursday 2:30 p. m., Section on Education; Thursday 4 p. m., Section on Legislation.
9th session of the Association, Friday 9 a. m., general session.

By vote of the Section on Pharmaceutical Education (see page 190), the questions printed on pages 178 and 179 have been referred to the next meeting for discussion.

MINUTES

OF THE

THIRTY-SIXTH ANNUAL MEETING.

FIRST SESSION—MONDAY AFTERNOON, SEPTEMBER 3, 1888.

The large hall of the Detroit Light Infantry Armory, located on Congress street, between Randolph and Bates streets, in the city of Detroit, had been selected for holding the thirty-sixth annual meeting of the American Pharmaceutical Association.

On Monday afternoon, September 3, the members present in Detroit assembled in the meeting-room, and, more than a quorum being present, the session was opened at 3:30 p. m. by President J. U. Lloyd, who introduced Rev. Mr. C. R. Henderson, who offered prayer, after which Hon. Wm. C. Maybury was introduced, who addressed the meeting as follows:

MR. PRESIDENT AND LADIES AND GENTLEMEN:

The Mayor of the city of Detroit, being absent from the city, has deputized me to speak a few words of welcome to the members of this Association. You are indeed, one and all, welcome to the city of Detroit. There are no places in our city in which we take a greater degree of pride than the great laboratories where the art of pharmacy sends out its products for the comfort and the necessities of the people. You coming here as co-laborers of these men in our community, we honor and esteem you and them. No better, no nobler introduction to the hospitalities of the people of the city of Detroit could be had. I had occasion incidentally to walk through the exhibit made in the neighboring building, and it occurred to me that so many of the traditions of my boyhood were being ruthlessly swept away. I looked in vain for the old bundles of catnep that used to hang from the shelf, and I wondered if the day had really come at this time of my life when the virtue of medicine was not governed by the bitterness of the dose and its nastiness in odor. I expected, as much as could be, to look as I did when I was a child, face all awry, upon the catnep steeping upon the fire, and I wondered if it was possible that the strength of the medicine was not governed by its quantity nor its bitterness, and if it was really possible that the administration of medicine was not to be in the old boot jack fashion of being held up under the arm of the elder brother; but my experience has taught me that in the little tasteless capsules there are no longer terrors for man or boy, since they enable us to take even extraordinary doses of medicine just as easily as many of us walk up to the modern soda-fountain and take the sparkling and refreshing water.

I missed another thing, my friends. I wondered where in the world the mysterious compounder was that I used to see when I was a boy. Then, when taking a prescription from my mother to the drug store, I would put it into the hands of a most mysterious person, who walked behind his barricade with an air of silence, and who, after cruel moments of agony while I waited wonderingly, came back and passed me the medicine to carry home. If he had the knowledge, he kept it; if he had great secrets, they belonged to him, or I had bought a portion of them for a few cents; and when he passed away to heaven they were with him, and I wondered where he was. I wondered where this apothecary had gone, who had put such a silence upon his knowledge. I thought I saw a better day, when mysteries are being opened up for the good of humanity and displayed to open, honorable competition; when, in great laboratories, skilled minds and cunning hands put together for use in every emergency the virtues gathered from bark and from tree, from the shrub of the valley and from the mineral that crops out in the mountain—when every secret of nature is being closely explored, so that she seems to have but few mysteries left for us. I thought, here is progress. I said you were welcome one and all to the city of Detroit as co-laborers with those in this city; but there is a higher and a grander reason why you and men like you are welcomed by every heart to the home circle. I suppose there are no men in the world who reap the benefits of life's labors so abundantly as the good practicing physician. He sees the light of gratitude fall upon him in beautiful rays from the eyes of those who hear his words of hope; words of commendation fall upon his ears, and each day closes with the consciousness that during that day he has tried to alleviate human suffering. But what would the labors of the physician be, my friends, and what would his success be, if your high calling were not discharged with a sense of high duty?

The longer I live the more I am impressed with this truth, that there is no labor for the individual, and none for an association of men, that is simply selfish when it rises to the dignity of saving human life. Laboring for myself alone, if the object and purpose of my life be not in a measure for another, my existence is not weightier than that of the bird that flies in the air, or of the fish in the sea, or of the animal that browses upon the sod. Just in the measure that my labor is not merely for myself, but for humanity, does it rise to the high level that under no other existence can be reached. Such, my friends, is your administration to the comfort and to the necessities of mankind; such is the labor in which you are engaged. Then why should you not be welcome to the city of Detroit, and welcome to the heart of humanity everywhere? (Applause.)

The President called upon the first Vice-president, Mr. Alexander, to respond to Mr. Maybury's address:

MR. ALEXANDER.—*Mr. President, Ladies and Gentlemen, Mr. Maybury:* We have listened with pleasure to the address that has just been delivered in such eloquent and complimentary language that we all seem at home in the city of Detroit—this beautiful city, with its magnificent buildings, its broad and shady avenues, its fine parks, and its shores washed by that grand, noble river, the river of Detroit, upon whose bosom float the stately vessels which carry her commerce to the sea. It would not be the fault of the city of Detroit, sir, if we were not made happy by such surroundings and our visit not made one both of profit and pleasure. On behalf of the officers of the American Pharmaceutical Association and of the visiting members, I return to you our cordial thanks for your hearty welcome to this city—knowing, sir, that we will enjoy them very much, we accept with pleasure the hospitalities that have been tendered to us. (Applause.)

THE PRESIDENT.—The next business in order is the reading of the President's address. As my voice is not sufficiently strong so that those in the back part of the room could hear me, I will ask Professor J. F. Judge to read this address. He is the chairman of our Committee on Educational Matters.

Mr. Judge then read the President's address, as follows:

Fellow Members of the American Pharmaceutical Association: It has been customary for those who have preceded me in this office to present an address on the general work and condition of our Association, and to suggest methods that might prove of benefit in the future. It devolves upon me to submit to your consideration problems that now confront us, that come partly from within but mostly from outside our membership; but we are all forced to meet them, for we cannot thrive on methods adapted to the past, while competitors outside of our organization are free to grasp the innovations of modern times.

Our action in Cincinnati in recognizing commercial, legislative, educational, and scientific sections, is an admission of this evolution; and the connected phases of this problem of re-organization, I think, should not longer be overlooked.

The truly educated apothecary, although he does not sustain himself by fees, stands as high in the community as the men who earn their living by positions in the professions, and I see no reason for us to be dissatisfied with the scientific and commercial view of our calling; but the practice of pharmacy ought to rest henceforth as heretofore on a scientific basis, no matter how far it may branch out into commercial applications. I accept the existing conditions, and feel that it is my duty to address you on what seem to be vital issues, those on which we more or less differ among ourselves, partly by reason of different circumstances, but which constitute principles upon which we may honorably differ. It is plain that my opinions are often radical, and I think that many of the suggestions offered herein will scarcely at this date command the support of more than a bare minority even of the votes of this body, nevertheless they are none the less true, as I see the problem, and calculated to further the best interests of our general membership.

After writing this communication and reviewing the various problems embraced therein, I clearly perceive that concessions must be made by many of our members interested in various directions, in order to reconcile differences and complete the plan of reorganization begun in Cincinnati. Personal sacrifices ought to be willingly made where individuals disagree with the majority, but none will agree to make all the concessions, and I do not believe it necessary to oppress any section of our membership.

The originators of our Society recognized the differences in the professional and business conditions of apothecaries, for at the first meeting the address to the convention recommended a constitution "applicable to the present condition of the profession, sufficiently stringent to elevate the members above many things now too prevalent, and yet not so binding as to exclude a large number who, though well disposed, are unable to free themselves from participation in acts contrary to the highest standard, without a sacrifice greater than could be expected of them, should engage the wisest action of the Convention to render them practicable in their working." This difference has not lessened, in my opinion.

We should endeavor to place the organization on as firm a basis for future work, at least for some years, as is possible with a society that is made up of persons who necessarily differ as we do on what is or is not best adapted to the general welfare, and whose business and professional interests often clash and antagonize as we pass through these evolutions of change. I have neither allowed personal matters, desire for theoretical impossibilities, nor personal friends' interests, to in any way control these recommendations, as will be evident I think to all our members.

If we cannot agree on establishing a recorded list of commercial and professional rules—and it may be thought best to evade it—each member will conduct his affairs and his relations to his fellow pharmacists according to the necessities of the case and his own idea of moral and commercial right, as is made necessary by the peculiar commercial, professional and business competition that he cannot control and which confronts and surrounds him. In this case, the Golden Rule might well be accepted as our code of ethics, our rule of business.

In reviewing the history of our Association, I am convinced that it was designed by its founders to be an aid to the apothecary, educationally and pecuniarily, and to be made up of apothecaries only,* and I believe that the title should have been *The American Apothecaries' Association*, and perhaps it should now be an apothecaries' association. Perhaps we should seriously consider as to whether the constitution should not be amended or by-laws added thereto, if it is now possible, so as to exclude from voting for officers, holding elective offices (excepting clerical work), and from business debate (scientific problems permitted), all members of our Association who are not actually apothecaries and personally engaged in dispensing medicines. Such a course would, perhaps, bear hard on a few of us (professional as well as commercial members). The clause added to the Constitution in 1855 by Mr. Parrish, as follows: "SEC. 2. Pharmaceutists, chemists, and other scientific men who may be thought worthy of the distinction, may be elected honorary members upon the same conditions and under the same rules as appertain to active members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office nor vote at the meetings," was perhaps wisely considered.

Requirements of business, advents of great pharmaceutical corporations formerly unknown, with which many dispensers now believe they have to contend; men who were dispensing apothecaries passing into other channels scarcely connected with the dispensing business but holding active membership; men who were apothecaries becoming editors, teachers in colleges, manufacturers, but not practically interested in the problems that actually confront working apothecaries; appearance of new preparations and new drugs that are not in his hands, even patented by foreigners, and used in regular medicine; traveling agents selling sundry pharmaceutical preparations, and manufacturers advertising them and inducing physicians to specify certain brands of officinal preparations, to the exclusion of the apothecary, together with the disappearance of well-worn products of the apothecary's art years ago in favor of new substances, have revolutionized our business, and at last forced ancient rules of government, as they have the medicinal preparations of other days, into a position of secondary value. This has necessitated and been followed by a change in the method of business of the American Pharmaceutical Association, as recognized by the formation of the Sections in Cincinnati in the year 1887. I am well aware that some of the foremost men of our Society would be excluded from many present privileges by the adoption of an amendment such as I have indicated as perhaps being inducive to the best interest of the apothecary. Among them will be my dearest friends and myself, but I nevertheless believe that the ranks of the dispensing apothecary can furnish men who in every way are qualified to conduct affairs, and I believe that I voice the views of most of those who may be excluded when I assert that each of them will hereafter as willingly give aid and special advice, and work on scientific and other problems as zealously, as though actually dispensing apothecaries. Such a course might remove from this body important sources of contention and antagonism, and prevent dissensions.

If such action is deemed advisable, many of the suggestions in the part of the address that follows may be superfluous, as it is written to meet existing conditions. We should not neglect to also establish the status of our professional men, those who instruct us in journals, who teach our students, who aim to establish for themselves a code of ethics that is their right, but who have no right and probably would not desire to thrust it upon the business apothecary and trade member, scientific or commercial. They are as much outside the ranks of dispensing apothecaries as the factory manufacturer is, and their affiliations are as different as commerce is from a profession, and we should not neglect to protect their interests.

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* This word I use as applying to a maker, dispenser and handler of drugs and medicines, in contradistinction to *pharmacist*, which may now only signify a manufacturer. I admit the fact that no word is exclusive enough.

We have now exhibited in our organization the conglomeration of ideas that prevails in individuals who may be interested in various sections of pharmacy, and honestly in earnest, and yet diametrically opposed on business and ethical principles, and who must interpret differently a constitution adapted to other days, and that deals in generalities only. The founders of our organization conducted the affairs of the Association under a constitution that at the time answered their purposes, and the necessities of to-day result from evolution and change. The present could not then have been foreseen.

We will under any course probably lose members who honestly disagree with what will be adopted as the views of the majority, or whom our rulings excise, but these men can either form societies among themselves, or unite with the respective sections C. and F. of the American Association for the Advancement of Science, or enter departments in pharmacy in Medical Associations.

The American Pharmaceutical Association is now incorporated and has a recognized legal existence. It can either sue or be sued, and any reflection that we make in our meetings on a member's pharmaceutical politics, unsupported by a decisive clause of our constitution, if injuring his credit or his business, is actionable in the courts, and damages can be recovered of us as of an individual.

The personal opinions that follow regarding the various points under consideration are of course only individual suggestions, and only as such can be considered. Alterations in the conditions of any of the subjects would materially affect my views of the others; consultations with several well known apothecaries to whom I am deeply obligated for free expressions, have already induced me to modify parts of this paper in directions wherein I was shown that my opinions were impracticable, and I claim a right to further change my opinions under presentation of arguments and new issues. It is probable that many points are overlooked, and that many may arise when the Association takes hold of the subject, and I realize the imperfect and incomplete condition of this paper as a whole; but as a skeleton to begin with it may serve its purpose when such parts as are acceptable are finally elaborated under the careful consideration of our Society. It will at least serve as an introduction. This is a very difficult subject,* and that apothecaries of the highest standing differ on the various points, is assured by the criticisms of the several reviewers from whose several views I have profited. That time will be required for deliberation is probable, and realizing the difficulties that have contributed to the formation of my own ideas in studying the subject, so as to embrace the various interlaced problems and review them in justice to all, I believe that haste on the part of our Association in revising our by-laws will be at the expense of completeness.

If it is decided by this body that it is not politic to face living issues and to enter now into detailed discussions, or that the rules of government of former times are elastic enough and answer for the present, it will be useless to consume your time with the reading of the communication that follows.

1st. I recommend that a by-law be framed so as to make it a duty of each apothecary of our membership to encourage apprentices in obtaining pharmaceutical education, to attend pharmaceutical schools with laboratory instruction, and insist that they qualify themselves to prepare such preparations as are considered by the revisers of our pharmacopœia to be adapted to preparation in our shops.

A positive expression of our views to this effect seems to me proper. We should, in my opinion, advocate in a by-law the taking of apprentices only of those who have a good school education, that will assure creditable progress in their pharmaceutical studies, and an early entrance into a college of pharmacy under a stiff preliminary examination, and if possible we should specify certain qualifications that are standards of proficiency. Our pharmaceutical schools are endeavoring to raise their standards by demanding preliminary examinations of applicants, and to further this laudable aim, and as an act of justice to the apprentice, apothecaries should exert themselves and exercise due caution regarding the accomplishments of apprentices before admitting them to the "entrance portal of pharmacy."

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* This paper was written November, 1887.

If this is done, and proper inducements are made for study and investigation by legitimately discriminating between that which enhances and that which lessens our real educational and commercial standing, classes of students increasing in numbers will probably succeed each other, with a continued upward educational tendency. I question, however, if it is possible to obtain the best results, unless substantial commercial returns are offered; for I doubt that pharmacy proper now holds out sufficient incentives to attract purely scientific investigators or professional students. That commercial considerations cannot be ignored is evident, and that these are honorable and commendable if properly considered is undeniable; and, to demonstrate this fact, we need only study the necessities and object of nearly one hundred per cent. of the students of our colleges of pharmacy, few of whom can ever be professional or exclusively scientific pharmaceutically and live on resultant incomes. Let us aim to send unexceptional material to these colleges, young persons with preliminary educations amply sufficient for solid scientific foundations, and assist our teachers in their laudable efforts to return to us classes of young people whose qualifications are inferior to none that come from other institutions of learning and who will be encouraged thereafter to work, study and investigate in order to excel in knowledge as well as to reap a pecuniary reward; who will understand that if they excel in any direction connected with our avocation, commercially, scientifically or professionally, they will be recognized and their rights protected by a true and liberal construction of our business and pharmaceutical rules of government. Do not let us misrepresent to them; the apothecary *must* work to live, he must deal in merchandise, he must be to an extent a merchant as well as a student; and it is wrong to lead an apprentice to any other view than that it is honorable alike to work in both directions, and that neither antagonizes the other. I strongly urge a by-law or rule covering these subjects.

2d. I will not deny that these great modern manufactories (manufacturing industries) are indirect antagonists of the apothecary. Gradually they have grown upon us, of us, and are here to remain. They have revolutionized the medicines of this country, and that too without their managers intending to injure the apothecary. Business competition between themselves, irrespective of the apothecary, has rendered them aggressive towards each other and they strive to excel each other in products and quality. With shrewd but gentlemanly solicitors in every precinct, with advertisements before every physician, with smart business management and monstrous centralizations of capital, they contest with each other. The apothecary is treated with the utmost grace, for these men are not intentionally enemies of the dispenser—they are really friendly, very; but methods, necessary to their own self-existence, force apothecaries to look for pastures new. The factory cannot be displaced, but factory specialties will increase and displace old-time crude remedies; irresistiby these specialties will wedge themselves into favor of physicians, the old style preparations are even now largely obsolescent, and as they disappear, the apothecary becomes a handler and not a producer. If it is possible for apothecaries to better their position in the face of this friendly competition, I believe it is by a determined stand in favor of the business rules that follow, by an open expression of common sense business principles, without the impracticable professional visions that several of us have harbored in the face of recurring events that read backward plainly.

3d. Upon the other hand, apothecaries perceive that physicians are in many places unconsciously grasping the idea that the apothecary is a "middle man" and that he is unnecessary except as a convenience. Elegant ready-made and dosed factory preparations brought continually to his direct attention, naturally entice him away from those of the apothecary which are often more crude; he dispenses them himself to his patients as served by the energetic manufacturer; he *insists* on getting them, and is frequently too well informed regarding their prices to permit apothecaries anything more than a small commercial commission for handling them.

To meet this modern competition and also to retain the trust of the public in the educated and experienced pharmacist, the drift of the times evidently points to the necessity of the apothecary of the future preparing himself in a knowledge of the principles of medicine and graduating in such as well as in pharmacy.

We welcome among us physicians who qualify themselves in our direction, and I believe that it will likewise be found that the medical profession will reciprocate by commending any step that broadens our field of usefulness in the community. The phrase "*physicianed apothecary*" exists: the broader our education the better, regardless of the commercial phase of this issue. It is an educational principle as well as a commercial protection.

By all means, if possible, I think it is best for both physician and apothecary to pursue their vocations separately and harmoniously. I believe that each has enough in his own field, but the apothecary has nothing to lose and much to gain by *earning* the degree of M. D. Do not let us cover our eyes: the business of the apothecary is being more and more abridged.

4th. Can pharmacists pay a percentage to physicians for prescription favors?

This has been decided in the negative from the very start of our Association. "We hold it as unprofessional and highly reprehensible for apothecaries to allow any percentage or commission to physicians in their prescriptions, as unjust to the public, and hurtful to the independence and self-respect of both parties concerned"—*Proceedings of the National Pharmaceutical Convention, 1852, p. 25*—and I think this should be so stated in our by-laws. I will add though that such a by-law is probably not easily enforcible, by reason of the fact that collusion between pharmacists and physicians is not readily proven. I do not believe that any considerable proportion of the medical profession have ever stooped to such an act, and the same may be said of apothecaries. Why not record a rule to cover this subject?

5th. If physicians write prescriptions and designate mixtures under such assumed names as Tonic No. 1, Hepatic Pill No. 6, etc., leaving the formulas with a certain apothecary, who thus has the advantage of others, for he need not decline to give these formulas when demanded, and still may retain a practical proprietary right to the majority of the physicians' prescriptions, having earned no privilege of that description. Shall any member of our Association accept such formulas, and dispense them in that manner?

I am convinced that such a course is not consistent with accepted pharmaceutical ethics, and is neither elevating nor dignified in either participant, and we should so record ourselves.

6th. While it is neither feasible nor proper, as I now view our avocation, to attempt to prevent our members from dealing in patent medicines, I believe that by a united effort we may be able to render these substances less objectionable than they may sometimes be. None can controvert the fact that injury may result from the indiscriminate distribution of such secret mixtures as might by continual consumption lead to the unconscious acquirement of a mental slavery like the opium habit, if such substances are in market. I am of opinion that by means of proper solicitation from the Society, some of the various state pharmaceutical and medical organizations might exert themselves, and by coöperation induce legislative action in many states that would then by law, on the label of each preparation, necessitate the naming of the various drugs that are used in that preparation. If these preparations were placed before the people under their full composition, the injury that might otherwise result from the unconscious and continued employment of powerful narcotics in exceptional cases might be obviated; but to be of value, such a law must be strictly enforced.

Possibly such an aim on our part might not meet with opposition from some even of the powerful intrenched manufacturers of patented medicines. They probably realize that general reflections are broadly injurious, that the innocent now suffer in common with others, and that advertisements really push the sale of these remedies, and will do so regardless of the label if innocent.

7th. Can members of this Association recommend to the public for the cure of an ailment any article that is destined to be used as a popular remedy; or by personal solicitation, over the counter or otherwise, can we recommend a cure for any disease or ailment whatever, and thus infringe on the professional rights of the physician?

In cases of emergency the application of the apothecary's skill (as in accident, poison cases, etc., or where physicians cannot be obtained), are simple acts of humanity, that by-laws or constitutions cannot and should not regulate to the disadvantage of the public, and an inflexible rule cannot be drawn to cover this point. "In the present state of general medicine, we ought to be tolerant in the business of advising the sick, a privilege inherent with every individual."* However, the systematic prescribing by pharmacists who are not sufficiently educated in medicine and in the study of disease expression, or the advertising of unknown mixtures as family remedies, is in my present opinion, not to the best interest of the people; but while objecting to the principle, I admit that many apothecaries differ with me. One of the first acts of this Association was partly to decide against counter prescribing as follows: "We consider that the members of this Association should discontinue all such professional amalgamation, and in conducting business at the counter, should avoid prescribing for diseases when practicable."—*Proc. Am. Phar. Assoc., 1852, p. 25.* It seems to me that in order to be of use to the people, a pharmacist to prescribe for simple ailments must qualify himself by a proper course of study in a medical college. I do not thus oppose indiscriminative counter prescribing because of a desire to affiliate physicians; they can care for themselves and will not suffer at all; but because in my opinion it is neither proper in us, nor just to the community for us to do so, unless we are properly qualified in medicine and graced with the proper education. I believe that we should meet the problem and express our views of it; but we must recognize the fact that a right of humanity that neither laws nor resolutions can take away, permits individuals to both medicate themselves and advise others, and that often to refuse advice to a sufferer would be inhuman. We must also face the fact that man's first duty is to his own family, and if factory products and physician dispensers displace the apothecary, he will exert himself in his struggle for existence and medicate the people.

8th. Shall our members be permitted to secure patent protection for improvements on apparatus applicable to the preparation of pharmaceutical preparations and chemicals?

Patented apparatus has been recognized as legitimate from the beginning of our Association until the present, and patented forms of apparatus have been exhibited under the sanction of the Society, since I have been conversant with the operations of this body, and have been mentioned in the proceedings since its early day. I cannot rationally distinguish wherein there is a consistency in decrying trade-marks and copyrights without discrimination, and then supporting patents; but some of my professional friends who on general principle oppose all trade-mark and copyright protection (outside of books) do not oppose patents. These devices seem to me alike to be purely for self-protection and of the same class, and in my opinion if we decide against all use of trade-marks and copyrights (see following sections) we must, to be consistent, prohibit our members from taking out letters patent. The laws of our country recognize all of them as designed for self-protection only, and I cannot advocate a part when I cannot see that the others are, if legitimately employed, in the least objectionable. If an apothecary, commercial or scientific member, evolves a meritorious invention, he should profit thereby. I do not see that the views of the medical profession have any bearing on us (a few of our lecturers excepted). They profit by *professional* fees, not merchandise. There is now no professional fee for the apothecary, his competitor is too often a tradesman only. When the lawful period of patent protection has passed, the public receives the property.

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*Quotation from a review of this paper.

9th. If by investigation we produce a synthetical substance or new agent, which is proven by the medical profession to be of value in the treatment of disease, or is shown to be of use in the arts, shall we be permitted to patent the methods of preparation?

I am of the opinion that such protection will now further the ends of legitimate pharmacy, will stimulate education and study, and encourage our scientifically inclined young men to attend colleges and grasp higher education, as well as bring to our working members the return that belongs to workers, and which in reality is the same as any other invention of merit. It is not a theory we combat here, but a reality in business that confronts us, of recent date, not of our introduction—a problem that was once unknown to us, but which now overwhelms us. I firmly believe that such labor demands patent protection as much as though it be directed in any other way to the perfection of a meritorious invention, and it is so understood in other countries with which we now are in competition. Should we accept an argument that demands that the apothecary or chemist who works should divide with drones who do not work? I do not believe it applies to any trade or profession. I believe it to the best interest of our country and of this organization, educationally, scientifically and commercially, to encourage our members to investigate, study, work in original channels, seek the highest educational standards, and then we should protect their personal interests. When a patent expires the world profits. Let us not crush the American investigator, and open our doors to foreign products; give us an equal chance at least.

10th. If it should be decided unprofessional for us to protect our members in discoveries that they make, can we consistently distribute or put into prescriptions materials of a like nature that are patented, trade-marked or copyrighted by outsiders, either at home or in foreign countries? If our members are debarred the benefit of personal return for their own investigations, can we consistently assist others to profit by what we decide to be objectionable methods, but which the medical profession advocates or countenances as legitimate? Reference may be made to such patented bodies as Salicylic Acid, Antipyrin, Antifebrin, Salol, etc.

In my opinion, our members will agree that a reward of merit should now be extended American investigators as heretofore suggested (9th), and competition with foreign countries encouraged thereby. In fact, if we do not, we simply throw to some Europeans the monetary return and an honor that should remain here, or exclude from our membership men who will not submit to such rulings, and prefer to remain outside. My views of this subject are not as they were a short time ago, but I believe that a careful study of this problem has enabled me to differentiate between a lost cause and living issues. If we do not stimulate such real pharmaceutical investigations and work, we will be in the inconsistent position of opposing as illegitimate on one hand, and then handling and dispensing such medicines on the other; for the medical profession is willing to recompense discoverers, does prescribe these patented bodies, and will insist on getting them. "The apothecary is bound to dispense any preparation of such kind if prescribed by a physician,'' is a sentence excised from a review of this section by a well known apothecary.

There is a national significance in connection with this subject that we should not underrate. In case of war between our own and foreign countries, or among foreign countries, whereby our ports or others may be blockaded and commerce interrupted, we should have established plants on American soil for the production of all medicines for our people. Hence, every encouragement that we may extend to American investigators may be viewed as an endeavor to provide, as we are in duty bound, for our government in case of trouble. An army may be decimated by disease; medicine, next to food, is important. A common sense view of our country's position, it seems to me, must show this Association that even now we are too dependent on outsiders, and simple loyalty to our country should cause us to devise and support some course that will make America in this direction independent of foreign medicine manufacturers. It is a duty that this Association should not avoid, and I support it with the fact confronting me, that accepted ethics within and powerful interests without this body will combat these principles.

11th. Can apothecaries make secret mixtures for popular self-medication? For example, shall any member of the Association be permitted, under his name, to make a private cough mixture, blood purifier, tonic, or any other mixture used by the public to alleviate pain or administer to the comfort of humanity by self-medication? If the views of some of our unquestionably honest and most professional men, who are not usually dependent on dispensing medicines for a living, are to be taken as law to all of us, these are illegitimate. Others of us assert, and altogether, perhaps, from the ranks of the operative apothecary, that they cannot make a living without some such property, and that the community demands such preparations of them, and I know excellent apothecaries who will not be debarred that privilege. I am not interested directly or indirectly, having no interest in mixtures of drugs that are secret or any popular remedy; but I believe we should face the problem squarely, and say yes or no.

If we oppose secret mixtures for self-medication, I scarcely see how, to be consistent, we can avoid opposing all of them, not only outside but just as much inside of the apothecary's business. I see no way to differentiate here, and I believe it best to discard them altogether and so express in a by-law. These views are not based on the theory that we are obligated to accept a professional code of ethics simply to help the physician to make money and to uphold his opinion. If such preparations are objectionable, it is because names of diseases are indefinite. I question their general value as remedies, because I have no confidence in cure-alls that are used in a hap hazard manner, and because I believe the physician or physicianed apothecary is the proper person to prescribe for disease.

12th. If it be decided that apothecaries and others of our Association cannot make secret remedial mixtures and distribute them to the public, the question arises, may your members consistently sell others to consumers? If it is against the interests of the public for us to prepare such mixtures, some may argue that there should be no hesitancy, and that we should not permit ourselves to profit on an illegitimate traffic.

I dislike to strongly comment here, as I am not at present engaged in the retail business; but in my opinion our American apothecaries are and have always been medicine sellers, and a duty to the public demands that the public be supplied with such substances as American citizens desire to use as curative agents, providing we do not assume the responsibility of prescribing unknown mixtures. If proprietary makers of secret mixtures induce the people to demand these mixtures, apothecaries are relieved from most of the responsibilities as to the result of their application, unless they know that certain preparations are not safe, when they should not be sold. I believe that as a rule few apothecaries will or can decline to sell patents, even if strongly opposed to their use, and I fear that to debar them from traffic will greatly reduce the membership of this body, often where least anticipated. We are expected to supply what is known as *medicines;* we are not juries to say, you cannot medicate yourself, or you must go to this or that medical pathy; and to intrude in this direction is uncivil in us.

13th. Can apothecaries and other members make secret mixtures in bulk for others? Some of our members prepare, or may yet desire to, various mixtures in bulk for those who desire to bottle and then distribute them as secret remedies; and it may be questioned if such application of pharmaceutical knowledge is consistent with a decision against their preparation by the apothecary (if so decided) to dispense to the public under his own supervision.

In my opinion there is a distinction, for these same persons can easily purchase the ingredients separately, and none can object; the mixing of them being a simple matter of convenience. It seems to me that the mixer is in no wise responsible for the use that may afterward be made of the mixture, if of innocuous materials, and I believe that to mix in bulk for public medicine manufacturers is different from making such substances ourselves and advertising them to customers, labeled under our authority as family remedies.

However, due care should be observed that energetic or poisonous drugs be not rashly placed in the hands of the ignorant, and it seems to me in this regard that we should be expected to exercise careful restrictions.

14th. Is it proper for us to invent a name for a mixture of well known drugs, and then trade-mark the same, thus practically securing to an individual for a period of years the exclusive sale of a simple mixture?

That neither the medical nor the pharmaceutical professions are now uniformly committed against this course is evident from a consideration of reputable physicians' prescriptions, and reputable apothecaries' actions. Nevertheless, many of us have not thought it proper to take advantage of this form of proprietorship, and I can see no stimulation to pharmaceutical labor and skill, nor protection of public interest, in excluding public competition from the making of mixtures that require little if any skill, and no investigation. We should, however, learn the will of the members of our Association, and express it for the benefit of our members who may now be interested in, and favor such mixtures. I believe that the medical profession is advancing in the direction of simples, and not mixtures, and it seems likely that dissected constituents or single drugs instead of conglomerates will be largely the medicines of the near future.

15th. Can we secure copyright or trade-mark protection for prints, labels, etc.?

Many of our members maintain that such protection is recognized in all branches of business, that professional men among us who are earnestly opposed to all such proprietary rights being vested in either apothecaries or commercial members, copyright books when they write them; and none will deny that unquestionable authorities in the medical profession (to whom we are referred as standards on ethics), avail themselves of copyright protection in that direction if to the furtherance of their own interests. If we exclude trade-marks (which I do not advocate—I favor them under proper restrictions), should we not, to be consistent, exclude copyright labels? However, I am of the opinion that to indiscriminately banish either of them is now irrational. It is discrimination that is demanded, not ostracism. The cry against trade-marks and copyrights has been perhaps made and accepted without necessary differentiation, and many of us fail to see that protecting an apothecary or other person of our membership against a pirate is more degrading in principle or injurious to the public than protecting the writers of our publications against piracy. I believe that if any of our members wish simply to adopt a peculiar style of print or label, they have an unquestionable right to avail themselves under the laws of our country of the privileges other business men enjoy, providing (if demanded by our rulings) it is not to further a self-curing mixture for family use. The assertion that physicians do not recognize this as legitimate I believe to be usually erroneous, and the use of patented pharmaceutical apparatus and implements as generally admitted by us indicates that our own members really view this matter in the bearing I have given.

The American Pharmaceutical Association is now incorporated; virtually, this amounts to *both, a trade-mark and a copyright.* The National Pharmacopœia is copyrighted, and our Unofficinal Formulary as well, and to deny individuals of our members in cases where they wish legitimate protection the privilege that we enjoy as a body, seems to me illogical. However, we should draw distinctions. It should, I think, be plainly stated that to copyright or trade-mark a label is not the same as copyrighting or trade-marking *a cure for a disease* designed for popular self-medication (if this is decided uncommercial in us), and if copyrighting a label seems proper to protect the apothecary's or manufacturer's interests, I believe that such a distinction should be clearly made. The recurring argument that the views of some teaching apothecaries and the medical profession, being presumably opposed to trade-marks and copyrights, establish the ethics of others in this direction, I do not admit. The leaders in medicine wisely copyright their own publications to protect themselves, and I do not believe they have ever advocated blanket ostracism of just protection, although they properly object to connected abuses, and oppose secret mixtures.

A substance, to be legitimately protected by trade-mark, in my opinion, should be new, a definite product of real scientific investigation, openly described by the discoverer, so that others can understand its nature and origin, or even reproduce it, and under any other name than that affixed by the discoverer it should be free to the world. Simple mixtures of drugs, prescriptions, conglomerates demanding no skill or educational knowledge in their evolution, seem to me not to deserve any protection. Such trade-mark right is, I think, better for the community than patent protection, for patent protection excludes altogether, while this would make public and free, excepting only the use of a new word during the duration of the lawful protection of the trade-mark. If such discrimination be made, I believe that methods now known to a few only will become public, that may be of great value as applied to substances outside of the one to which the trade-mark is applied. In this connection, I will say that it seems to me that the period of registered trade-mark protection should be reduced to fifteen years.

16th. If all other trade-mark, patent, and copyright protections are declared by us uncommercial, can a member copyright a book on Pharmacy that is made exclusively for pharmacists and physicians?

Some of the members feel that the exclusion of all protection from the dispensing and practicing pharmacist and from our commercial members, so strongly advocated to this time by some of our members, is irrational and unjust unless all of our members who profit from the profession and live upon it, submit to the same ruling and relinquish their special literary protections that some argue cannot be justly diagnosed and separated from the labels, etc., that under our country's laws may be honorably copyrighted, trade-marked and patented. I do not overlook my own protection in this direction, but I have become convinced that if we exclude from the apothecary and business member the benefit of patent rights, trade-marks and copyright labels that individualize and protect for a period of years products that result from his study, ingenuity, skill and labor (excluding secret cure alls for public use), and if we force him into free trade with the world, others of our members who make their living out of the apothecary should acquiesce in the ruling. If it be decided that the working apothecaries of the country shall relinquish their privileges in this direction, writers of pharmaceutical publications should do the same, and neither the writer nor the compiler, publisher nor other person should avail himself or themselves of copyright protection to the benefit of those who remain members of our society, and I look for support of this view from our literary members on principles of justice. I am aware that it will be argued that booksellers will not issue publications under such conditions, and that writers will be pirated; but I am not persuaded that it is consistent to except them if we throw our operative apothecaries, scientific and commercial members into free trade with the monopolies and antagonisms by which they are surrounded. I believed it right to copyright the United States Pharmacopœia, I voted to copyright the Unofficinal Formulary, I copyright my own publications and favor such protection; why should we exclude others? Honest discriminative protection I believe will enhance our usefulness to the community, our elevation as students, enable us to compete with other countries and benefit the American people. The blanket opposition of many of our members, has been for years faithfully and honorably directed against all protection by law of the trade interests of apothecaries, and these efforts have been failures. Together with the medical profession, we are now confronted with the fact that it would probably have been better years ago to have endeavored to properly discriminate and to have dissected this problem sooner, and if *we* do not do so, I look for discriminative action from physicians. The fault is, I believe, not in the *use* but in the *abuse* of trade marks, copyrights and patents.

17th. If copyright, patent and trade-mark protection of every description is declared uncommercial (in our by-laws) will it be consistent for us to handle or dispense preparations under such protections when made by others, and that are demanded even by prescriptions of the medical profession? Shall we thrust from ourselves on ethical grounds (if so decided) the profit that might accrue to ourselves by this self-protection, and then distribute the same classes of substances when made by others for their personal profit?

We are, in my opinion, as before stated, not appointed judges of what is or is not a medicine. We conduct our business to supply the public with medicines, a part of the public being the physician and his patients. Energetic or poisonous bodies, the compositions of which are known to us, are subject to our discretion; but I believe that we have no right to exclude the public or the medical profession because of an ethical party view of our own, and to attempt to do so will be to our injury in the future.

18th. Shall we be permitted to make pharmaceutical preparations in which, while the ingredients are named, the method of compounding is withheld?

It is well known that the names and proportions of the constituents of a pharmaceutical preparation may be published, and still the reproduction of the preparation in appearance, taste and flavor by those who are not initiated into the details of the process will be practically impossible. Some of our members contend that such combinations are personal, as much as though the names of the components were withheld.

While I have never declined to give the United States Pharmacopœia any working process of my own that I have evolved, for manipulating any mixture whatever, I am not prepared to attempt to controvert the fact that methods of manipulation are often gained by much individual labor and expense. The exclusion from investigators of a partial reward for their labor (excepting those of our professional men who are well paid to develop for and *give* to the public), is perhaps irrational, and perhaps not conducive to pharmacal advancement in that direction; and I concede that if the names and proportions of the drug ingredients of any irregular preparation are public, as in non-secret preparations, we cannot perhaps demand more of an investigator or manufacturer. I now believe, however, that if such an irregular preparation becomes of such general importance as to be desirable for the United States Pharmacopœia, and is adapted to shop preparation, the owner should give the chairman of that committee full information upon application, regarding both its composition and method of manufacture, but I do not think he is under obligations to freely publish his processes on demand, to benefit only certain persons who perhaps may not be apothecaries at all (professional men living on independent salaries excluded).

19th. If we investigate a drug and by applied research discover an advantageous method of preparing therefrom some valuable constituent or constituents, can we properly claim that the discovery is our property?

Such a privilege I believe now furthers pharmaceutical investigation. Not only manufacturers of chemicals and pharmaceuticals of undoubted integrity and international reputation, zealously guard the proprietorship of knowledge so obtained, but the possession of such knowledge is generally considered a legitimate return for investigation, in fact is the only recompense for the labor and expense of a discoverer. I am convinced that unwise indiscrimination has to this time cast an unjust reflection on the apothecary, pharmacist or trade member, who aims to legitimately improve or elaborate, and who declines to publish to corporations about him and to his personal competitors the outcome of that labor, but who maintains that he has an individual right to any recompense that may follow such discoveries; and this course has, I think, injured American investigators. Instead of fencing the investigator and taking from him all incentive to a substantial recompense for his ingenuity and research, we should legitimatize a method by which our members will be for a time fairly protected (see preceding sections), and thus stimulate investigation and discoveries. We establish pharmaceutical colleges, we encourage the study of pharmaceutical literature, we ask our members to spend their time and money and make investigations; what incentive do we offer for a personal and honest commercial return? Is not the consideration of this question in a general sense of great impotance? We hear now the complaint that published individual work usually enhances the interests only of a certain few manufacturers. Do we not find that the apothecary is becoming discouraged, and that the days of the past, in which liberality in this direction brought honor, reputation and remuneration, have disappeared? Has not a restrictive construction of the apothecaries' rights been accepted by us "with outstretched necks" and pressed to the bitter end? This was once correct and praiseworthy, but we should now face existing problems.

20th. I believe, however, that it is for the public good that our members should give the chairman of the United States Pharmacopœia Committee any information that may be desired for the perfection of processes applicable to shop manipulation when desired for that publication, at any time that it becomes necessary to have them, and I have always done so; but this course should be general to be just. In this regard I am quite sure that many will differ, for some argue that an individual should not sacrifice a valuable property without remuneration, and insist that if the United States Pharmacopœia desires a franchise that is for the general public, that public ought to pay the owner thereof the value of his property; that to demand such just rights of our members without recompense is both unjust and illegal.

21st. Is it proper to label an officinal or other substance as though manufactured by us, when in reality it is only selected or perhaps purified?

Physicians and pharmacists are often willing to pay an extra price for the certificate of quality from a person in whom they have confidence, regarding a substance that they do not desire to make. Sometimes a name will inspire a confidence that is valued more than the price of the crude preparation, and, providing no reflection is cast on others, it is, in my opinion, legitimate to thus assume the final responsibility. Indeed, I doubt if it would be either possible or practicable to exclude such individuality, and the responsibility assumed by a selector or a purifier may be greater than that of the trade manufacturer. I do not recall that I am interested in any substance of this description, but I willingly pay others an extra price in several instances for substances that are certified to as though manufactured by the party from whom I get them. This privilege saves many of us labor and time that we could ill afford to expend for special examinations of small lots, and I favor such protection.

22d. I suggest that a class of liquid preparations of plants be made conspicuous in our Pharmacopœia, that may be used by all physicians. Let each of these preparations represent the drug, one grain to two minims, far as it is as practical to make them by simple percolation or maceration, one pint being obtained from eight ounces of drug without the evaporation of any reserved percolate.

Let the classes of fluid extracts and tinctures be merged into and give way as much as possible to this class of preparations, which from its nature may be made without any elaborate apparatus, and need not be purchased from manufacturers, all such preparations being easily made by the apothecary.

Physicians will at once understand that two minims of each of these preparations will represent practically one grain of crude material, thus approaching a definite strength, as near at least to a certainty as the science of medicine can now upon the other hand diagnose for and prescribe in disease expression, and they are as concentrated as it is necessary to have them.

I am convinced that such a course will simplify matters all around, will give as uniform preparations as the fluid extracts are, and will aid both the apothecary and the physician, and each apothecary can then select his own crude material to operate upon, and certify to the product.

If this step is inaugurated, the study of menstruums and best condition of crude material will be important, and I think these problems deserve more attention than we now give in that direction, and this study will lead to educational advancement; there is little incentive while we are handlers only of factory products. I propose this as a step in making apothecaries partly independent of outsiders, and inciting educational advancement. Should a syrup or elixir of any drug, or combination of drugs, be then desired, a uniform rule and a single simple elixir, or simple syrup, will permit of its extemporaneous preparation as a prescription; but I question if sweetness in medicine is not to give way largely to simple mixtures made extemporaneously at the bedside, mixtures of such preparations as I have named and fresh water.

Should it not be thought possible at this time to replace these two classes, tinctures and fluid extracts (and there are grave difficulties), by this one class, I think it would be unwise to cumber the Pharmacopœia with this additional one, and only suggest it as a means to further a desideratum. I believe that this move will meet the approval of the medical profession. No less an authority than Prof. Roberts Bartholow, in his recent address on Medicine, delivered before the American Medical Association at its last meeting in Cincinnati, objected strongly to the fact that the Pharmacopœia was cumbered with so many preparations of individual drugs. It strikes me as possible, as one step, to reduce their number, to the interest of both apothecaries and physicians, by erasing the fluid extracts and common tinctures and replacing by the class I have named.

23d. Sometimes it may be desirable to elect as your President, a man totally inadequate in the direction of parliamentary tactics, and of little value as a presiding officer. Whatever good reason may induce such a selection, I think that it will not be disputed that it is necessary to always have an accomplished parliamentarian as presiding officer, in order to facilitate the work of the organization. I can refer to this matter graciously, for I reflect only on my own shortcomings in doing so. The good judgment of this Association wisely associated with me a superior parliamentarian, capable, willing, obliging, and I thank you for the consideration shown me; but especially am I indebted to this gentleman, Mr. M. W. Alexander, who has so discreetly and acceptably conducted your meetings.

I believe that it would be well to honor such men and serve yourselves by extending them lengthened positions in presiding over us, and create in our body a new office, a presiding chairman, who can both preside over the general meeting, and fill vacancies in the absence of the chairmen of the sections.

The President elected by reason of a special fitness for other labors, will then have time to attend to his peculiar duties; he may appoint committees, etc., etc., during your meetings without the distractions attending the chairmanship; the conducting officer, elected by you at stated periods because he is really capable of being a parliamentarian, will conduct your deliberations in a proper manner. He will become acquainted with faces, names, and methods, and facilitate the order of your meetings. Will it not be to our interest to so change our By-Laws and Constitution as to give us this new officer, and if so, it can be done now better, perhaps, than at any future time. I will admit that some of our Presidents are capable parliamentarians, but it is sometimes desirable to elect men without such accomplishments. In support of this opinion, since writing this section, I have reviewed an editorial article by Dr. Fred. Hoffmann, on the subject, in the Pharmaceutische Rundschau (September, 1885), and extract the following sentence: "A thorough familiarity with the subject matters of the deliberations, and the rare gift of wise tact, of quick and good judgment, and of energy, are requisites for managing large conventions with success. If men with these talents and ability, and with comprehensive knowledge, can be placed, or have been found, at the helm of the Association, it certainly would be conducive to the best interests and efficiency of its annual meetings to retain them." If it is not considered advisable to add this new officer, I strongly urge that the Vice-Presidents be selected for the purpose of filling this position, and that the President-elect be relieved from the detail work of conducting the meeting, giving his entire attention to the real work of his office.

24th. I do not think that we have too many schools of pharmacy, but it seems that there is an unfortunate distinction between the salaries paid the teachers of the various colleges that should be equalized, and it is certain that some of our instructors do not receive a just compensation. In the University schools of pharmacy the professors have a fixed compensation, while in the colleges of pharmacy it is too frequently dependent upon patronage. However, as these colleges are private organizations, it is not clear to me how this body can take any direct action in the matter. If it is possible to induce our apothecaries to insist on accepting only well-educated assistants (see Section 1st), obtain State laws to create Examining Boards in all the States, induce these Boards to conduct rigid practical examinations, and, lastly, encourage apothecaries and manufacturers in various sections of the country to contribute directly to the support of colleges of pharmacy, I believe that the result will further the interests of the community and increase the scholarship of our colleges. These matters may perhaps be subject to discussion in the section for Pharmaceutical Education.

25th. I suggest that the secretaries of the sections be respectively paid a proper compensation, enough to cover their expenses to and from the meeting. They are expected to attend the meetings and work for us; their expenses should be paid.

The best interest of the pharmaceutical profession is not, in my opinion, as will be seen from this paper, to be gained by attempts to restrict by repressive rules our members' personal affairs in directions where it is impossible to meet individual perplexities and modern business competition, for they must all adapt their actions to individual circumstances. My experience with the Ohio Legislature when we obtained our Pharmacy Law, taught me that rules of government must be viewed from a liberal stand and not from a personal or factional desire, and I believe this must be true of the rules adopted by our organization, if we best subserve the public and our members' interests, commercially, educationally and fraternally. Modern issues, principles of pharmaceutical politics on which we differ among ourselves and of which this paper presents a few, should be revised in all candor, regardless of personal affiliations, and to the best interests of the community and ourselves, and they are perplexingly interlaced. If we can meet existing problems by harmonious discussions (it seems easy to do so), it is not impossible that our membership may be materially increased and that acrid differences between individuals of our organization may be avoided; they are unnecessary. The greatest good to the largest number should be our motto; principles may divide us, but personalities should not appear.

In conclusion, I desire to express my thanks to our officers and members who have aided me in Association duties when called upon, as well as to those who have entered with spirit into the evolution of this paper.

Vice-President Alexander occupied the chair. On motion of Mr. Good, the President's address was directed to be referred to a committee of three for consideration and report.

The Permanent Secretary read the report on credentials as examined by Council. In compliance with Chapter VIII, Article V of the By-Laws, credentials had been received two weeks before the meeting from 8 Colleges, 19 State Associations, 5 Alumni Associations, and 5 county and other local Associations. The complete list of Associations from whom credentials had been received, is as follows:

Colleges of Pharmacy: California, Chicago, Cincinnati, Louisville, Maryland, Massachusetts, National (at Washington, D. C.), New York, Ontario, Philadelphia, Pittsburgh, and St. Louis.

State Pharmaceutical Associations: Alabama, Arkansas, Connecticut, Dakota (North and South), Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Tennessee, Virginia, Wisconsin, and Province of Quebec.

Alumni Associations: Chicago, Cincinnati, Louisville, Philadelphia, St. Louis.

Local Associations: Cleveland, O.; Connecticut River, N. H.; Dauphin Co., Pa.; Kings Co., N. Y., and St. Louis Club of Microscopists.

The Secretary of Council read the names of 126 persons proposed for membership, all of whom were, on motion of Mr. Seabury, invited to join.

Reports being called for, the introductory portion of the Report on the Progress of Pharmacy, and the Report of the Committee on National Formulary, were read by title and laid on the table. Besides the Committees reporting to Sections or to the Council, the following Committees were called on for reports: On Prize Essays; on the Revision of the United States Pharmacopœia; on Management, and on Visit to the National Wholesale Drug Association.

MR. ELIEL.—I did not understand that the Committee on Prize Essays was to report at this time. The Chairman of the Committee, Prof. Markoe, wrote me that he presumed that the papers would be read at this meeting. I do not see how that Committee could act on papers read at the last meeting, inasmuch as the Committee was not appointed until after the papers had all been read.

THE SECRETARY.—If Mr. Eliel will refer to the By-Laws, he will find that they have the power to act upon the papers read at the last meeting in relation to the prize to be awarded from a special fund.

MR. ELIEL.—That being the case, I have no report.

The Secretary.—Three months ago Prof. Markoe told me the report would be ready, and I thought it would be here.

Mr. Sloan.—I move that this Committee have further time.

The motion was adopted.

Mr. Ebert.—The Committee on the Revision of the United States Pharmacopœia have no report to make at this meeting. We have had no meeting. The committee will have to be somewhat modified before we can have a report, because one of the members has removed from the country. We will have a report at the next annual meeting.

Mr. Remington.—The Committee on Management have no report to make at this time. They had a meeting, and have concluded that as the new arrangement was to be on trial this year, if it is the wish of the Association to continue the committee until the meeting is over, in order that any necessary business may be attended to, they will cheerfully attend to it. Mr. President, that By-law which speaks of the reports of committees being presented at the first session, was left unaltered by the Committee on Management for the special purpose of covering the reports of committees on general business that could not be made to special Sections, and I see that the Permanent Secretary has understood it in that way. Of course there are reports of committees to come up under the By-laws before each Section in the proper order of business.

The Chair.—That is correct. The Chair so understands it.

Mr. Remington.—The meeting of the National Wholesale Druggists' Association has not yet taken place.

The appointment of the Nominating Committee being next in order, the delegations present from the different States made the following appointments:

California.—Emlen Painter.
Connecticut.—Fred. Wilcox.
Dakota.—F. L. Haussamen, J. M. Du Bold.
Illinois.—T. N. Jamieson, C. W. Day.
Indiana.—G. W. Sloan, Jacob Baur.
Iowa.—Rosa Upson, C. D. Wangler.
Kansas.—L. E. Sayre, R. J. Brown.
Kentucky.—E. C. Pfingst, O. E. Mueller.
Louisiana.—Mrs. E. Rudolph, Wm. Bogel.
Massachusetts.—Henry Canning, A. R. Bayley.
Michigan.—Geo. Gundrum, D. O. Haynes.
Minnesota.—Karl Simmon, J. C. Henning.
Missouri.—H. M. Whelpley, F. Hulick.
New Hampshire.—C. B. Spofford.
New Jersey.—Chas. Holzhauer.
New York.—Geo. J. Seabury, W. P. De Forest.
Ohio.—G. L. Hechler, John Weyer.
Pennsylvania.—Chas. A. Heinitsh, J. F. Patton.
Rhode Island.—H. J. Alfreds, Wm. E. Cates.
Tennessee.—A. A. Yeager, Jas. L. Thomson.
Wisconsin.—John A. Dadd, A. H. Hollister.
Prov. Quebec.—S. Lachance, E. Muir.
Prov. Ontario.—J. E. D'Avignon.

In addition to these, the President appointed the following members, not delegates from the Association at large: A. E. Ebert, Wm. Dupont, Edmund Bocking, John Ingalls, J. F. Judge.

The chair appointed Messrs. John Weyer, of Ohio; J. L. Lemberger, of Pennsylvania, and G. W. Sloan, of Indiana, the Committee on the President's Address.

The minutes of the Council since the last meeting of the Association were read by Mr. Kennedy, the Secretary of that body, and were on motion approved. These minutes, including the reports examined by the Council and referred to the Association, gave the following information:

SECOND SESSION OF COUNCIL, HOTEL CADILLAC, DETROIT, SEPT. 2D, 8 P. M.,
(9 members present.)

The minutes were read and approved, showing that the following business was disposed of by correspondence since the meeting at Cincinnati:

October 26, 1887. Moved by Mr. James Vernor, and seconded by Messrs. Dupont and Maisch, that the next meeting of the American Pharmaceutical Association in Detroit convene on the first Monday, third day of September, 1888, at 3 o'clock, p. m.

Adopted.

The following report was received and communicated to the members of Council.

WASHINGTON, D. C., *October* 29, 1887.

TO THE COUNCIL OF THE A. P. A.,

Mr. Chairman:—The undersigned, a committee appointed by the Council at one of its meetings, in Cincinnati, to "consider the question of incorporation and report to the Chairman of the new Council as soon as practicable," have the honor to submit the following:

1st. That the American Pharmaceutical Association be incorporated under the Act of Congress for the creation of corporations in the District of Columbia.

2d. That the members of the Council, seventeen, and eighteen members of the A. P. A. that reside in Washington, be named as incorporators.

3d. That the declaration herewith submitted be adopted.

The following points taken from the above named Act of Congress, are pertinent to this question:

1st. A majority of those named as incorporators must be citizens of the D. C., hence 18 of the 35 incorporators provided for are residents of Washington. Their associates or successors—that is, the other members—may reside anywhere.

2d. The finances of the Corporation must be entirely under the control of a board of trustees or managers. To comply with this requirement the members of the Council, eventeen, are named as managers for the first year. This number may be subsequently —after the first year—changed by the Corporation. It will be observed that the declaration, with all the provisions required by the Act of Congress referred to, is so drawn as to be entirely in harmony with the existing Constitution and By-laws of the Association, so that no changes whatever will be required in either of these.

The Act permits incorporated bodies to make their own By-laws and other regulations. It only insists that the finances and general business of such bodies shall be managed by a Board, in the same manner as our Association at present provides that they shall be managed by the Council.

It is not deemed prudent to give the names of the members from the D. C. that are to act as incorporators, as some changes in the names might become necessary between the time of acting on this report and the signing of the declaration. It is thought better to have the committee that may be charged with executing the wishes of the Council, authorized to select the persons to be named.

Respectfully submitted,

W. S. THOMPSON,
S. A. D. SHEPPARD,
JOHN M. MAISCH.

CERTIFICATE OF INCORPORATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Whereas, We, the undersigned, desire to form an Association having for its object to unite the educated and reputable Pharmacists and Druggists of America, as will more fully hereinafter appear;

Now, therefore, we do hereby certify as follows:

First. The corporate name of the Association is the American Pharmaceutical Association.

Second. This Association shall continue until dissolved by the action of its members, or by operation of law.

Third. The objects and business of said Association are as follows:

a. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

b. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

c. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and in encouraging home production and manufacture in the several departments of the drug business.

d. To regulate the system of apprenticeship and employment, so as to prevent, as far as possible, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

e. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

f. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

g. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and the greatest protection to the public.

Fourth. The concerns and affairs of the Association shall be managed by a Council, which shall consist of seventeen members.

Given under our respective hands and seals this day of
A. D., 1887.

November 15, 1887. Moved by J. M. Maisch; seconded by G. W. Kennedy:

1st. *Resolved*, That the Council approve the recommendations of the Committe one Incorporation.

2d. *Resolved*, That the Chairman of the Council appoint a Committee of three to carry out these recommendations.

3d. *Resolved*, That the Certificate of Incorporation, when procured, be placed in the custody of the Chairman of the Council.

4th. *Resolved*, That the Certificate of Incorporation and the Act of Congress for the creation of corporations in the District of Columbia, be published in the Proceedings for 1887 or 1888.

Adopted.

The following communication was received:

New York, *November* 25, 1887.

To the Council of the American Pharmaceutical Association:

Gentlemen.—The suggestion has been made by Mr. J. W. Colcord that the National Formulary Committee prepare as complete a set as may be practicable of the preparations contained in the forthcoming work, for the purpose of exhibiting them at the next meeting of the American Pharmaceutical Association at Detroit, which is expected to be very numerously attended, as the Michigan State Pharmaceutical Association will hold its meeting at the same time. This exhibit is primarily intended as an object lesson which may show the merits or demerits of the several working formulæ, and it is also believed that the collection could be exhibited to advantage at other occasions, particularly where the attention of the medical profession could be invited to it. Mr. Colcord's idea has found cordial approval and support among prominent members of the Association in his own State, as well as among the members of the Formulary Committee, and it has been decided to formally approve and adopt it. It would be manifestly unfair, however, to expect the members of the Committee—who have for several years devoted large quantities of valuable material to the necessary experiments without expense to the Association—to furnish the materials and containers for such an exhibit at their own cost. If the plan is adopted, it will therefore be necessary to provide the means of reimbursing the several members for their outlay. In order to bring this matter properly before the Council, I herewith submit a motion which has been passed by the Formulary Committee :

Resolved, That the Council of the American Pharmaceutical Association be informed of the suggestion made, viz., that a collective exhibit of the preparations of the National Formulary be prepared in an attractive and convenient manner suitable for exhibition, and that the Council be requested to appropriate for this purpose a sum not exceeding two hundred ($200) dollars.

It is not expected that the cost of the collection will amount to the sum named ; but as neither the size of the containers nor any other detail has yet been settled, it is believed preferable to appropriate an ample amonnt. The Council may rest assured that the expenditures will be made with due economy and judgment.

Very respectfully, CHARLES RICE,
Chairman of Committee on National Formulary.

December 5, 1887. Moved by S. A. D. Sheppard, and seconded by G. W. Kennedy, that the communication from the Formulary Committee be received by the Council, and that in conformity with the request contained therein, a sum not exceeding two hundred dollars be, and the same hereby is appropriated from the treasury of the Association to cover the expenses of a collective exhibit of the preparations of the National Formulary, to be prepared by the Formulary Committee in an attractive and convenient style, suitable for exhibition.

Adopted.

Report of the Editing Committee and resolutions of Council relating to delay in the publication of the National Formulary. See Proceedings 1887, pages 646 and 647.

April 3, 1888. Moved by A. H. Hollister, and seconded by G. W. Kennedy, that the Council extend to the Michigan Association a cordial invitation to meet with us in our Tuesday evening session at Detroit.

Adopted.

May 16, 1888. The Chairman of the Council, Mr. W. H. Rogers, appointed the following committee to examine the Treasurer's books: M. W. Alexander, J. M. Good and F. W. Sennewald, all of St. Louis.

The Chairman reported that the certificate of incorporation of the Association was in his possession. In accordance with a resolution passed (see page 20), it will be published in the Proceedings for 1888.

THIRD SESSION OF COUNCIL—HOTEL CADILLAC, SEPTEMBER 3D (14 members present).

The propositions of 126 candidates for membership were examined, and referred to the Association.

The following report was read, and on motion of Mr. Hollister, accepted:

The Committee on Finance respectfully report, that according to the books of the Treasurer (which have been passed upon by the Examining Committee appointed by the Council, and found correct), the total amount received during the current year was $7937 05

As follows:

From Chas. A. Tufts, Ex-Treas.	$2195 00	
From Issue of 26 Certificates	155 00	
From Sale of Proceedings	80	
From Sale of Badges	1 75	
From Centennial Fund	52 75	
From Ebert Fund	24 00	
From Interest on Deposits, New England Trust Co.	102 75	
From Annual Dues	5405 00	
Which with the Cash Balance on hand July 1, 1887, of		4719 44
Make a Total Amount of		$12656 49
The Disbursements amount to the sum of (for items see Treasurer's report)		10280 42
Leaving a Balance of		$2376 07
To this Cash Balance may be added delinquent dues considered good by the Treasurer, to the amount of		5215 00
Making Total Assets (outside of Invested Funds)		$7591 07

Your Committee find the Invested Funds in the hands of the Chairman of the Council, Mr. Wm. H. Rogers, to be as follows:

Ebert Fund.

U. S. Reg. 4 per cent. Bond, $100. No. 160603	$127 00	
" " " " $500. No. 67880	635 00	
Cash, Savings Bank, Dover, N. H.	34 00	$796 00

Centennial Fund.

U. S. Reg. 4 per cent. Bond, $1000. No. 145640	$1270 00	
" " " " $100. No. 160604	127 00	
Cash, Savings Bank, Dover, N. H.	30 10	1427 10

Life Membership Fund.

U. S. Reg. 4 per cent. Bond, $1000, No. 145639	$1270 00
" " " " 1000, No. 145761	1270 00
" " " " 1000, No. 145762	1270 00
" " " " 100, No. 160605	127 00
" " " " 100, No. 160606	127 00
" " " " 100, No. 160711	127 00
" " " " 100, No. 160712	127 00
" " " " 100, No. 160713	127 00
" " " " 100, No. 160714	127 00

U. S. Reg. 4 per cent. Bond, $100, No. 162830	$127 00	
“ “ “ “ 1000, No. 150826	1270 00	
“ “ “ “ 1000, No. 150827	1270 00	
“ “ “ “ 1000, No. 150828	1270 00	
“ “ “ “ 100, No. 164429	127 00	
“ “ “ “ 100, No. 164430	127 00	
“ “ “ “ 100, No. 164431	127 00	
“ “ “ “ 100, No. 165415	127 00	
Cash, Savings Bank, Dover, N. H.	107 72	9124 72
		11347 82

M. W. Alexander,
James M. Good.

Mr. Alexander presented the following report, which was accepted:

St. Louis, *July*, 1888.

The Examining Committee appointed by the Council, report that they have examined the books and accounts of the Treasurer, and find them correct, that his annual report agrees with his books, and that the pass-books of the banking institutions show deposits as reported.

Your Committee has also examined the invested funds in the hands of the Chairman of the Council, consisting of the "Ebert," "Centennial," and "Life Membership" funds, and finds that he has the proper securities in United States bonds, and the accrued interest deposited in bank, as shown by his bank books, according to report of Mr. Wm. H. Rogers, Chairman of Council, which is herewith attached and made part of this report.

M. W. Alexander,
James M. Good,
F. W. Sennewald,
Per Good.

EBERT FUND.

1888.			
July 1.	U. S. Reg. 4 per cent. Bond $100, No. 160603	$127 00	
	“ “ “ “ $500, No. 67880	635 00	
	Cash, Savings Bank, Dover, N. H.	34 00	$796 00

CENTENNIAL FUND.

1888.			
July 1.	U. S. Reg. 4 per cent. Bond, $1000 No. 145640	$1270 00	
	“ “ “ “ $100 No. 160604	127 00	
	Cash, Savings Bank, Dover, N. H.	30 10	1427 10

LIFE MEMBERSHIP FUND.

1888.		
July 1.	U. S. Reg. 4 per cent. Bond, $1000 No. 145639	$1270 00
	“ “ “ “ 1000 No. 145761	1270 00
	“ “ “ “ 1000 No. 145762	1270 00
	“ “ “ “ 100 No. 160605	127 00
	“ “ “ “ 100 No. 160606	127 00
	“ “ “ “ 100 No. 160711	127 00
	“ “ “ “ 100 No. 160712	127 00
	“ “ “ “ 100 No. 160713	127 00
	“ “ “ “ 100 No. 160714	127 00
	“ “ “ “ 100 No. 162830	127 00
	“ “ “ “ 1000 No. 150826	1270 00
	“ “ “ “ 1000 No. 150827	1270 00

July 1.	U. S. Reg. 4 per cent. Bond, $1000 No. 150828	$1270 00	
	" " " " 100 No. 164429	127 00	
	" " " " 100 No. 164430	127 00	
	" " " " 100 No. 164431	127 00	
	" " " " 100 No. 165415	127 00	9017 00
	Cash, Savings Bank, Dover, N. H.	107 72	107 72
			$11347 82

The Auditing Committee has examined the above statement, and finds that the bonds of the Ebert Fund, Centennial Fund, and Life Membership Fund, are intact, and agree in numbers and value with statement, and the balances are correct as per bank books.

M. W. Alexander, Ch. Com.

Mr. Sheppard presented the following, which on motion of Mr. Diehl was accepted and referred:

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR THE FINANCIAL YEAR JULY 1ST, 1887, TO JULY 1ST, 1888.

RECEIPTS.

Cash on hand July 1st, 1887	$4719 44
Received from Ex-Treasurer Charles A. Tufts	2195 00
Received from the sale of 26 Certificates	155 00
Received from the sale of Proceedings	80
Received from the sale of Badges	1 75
Received from the Centennial Fund	52 75
Received from the Ebert Fund	24 00
Received from Interest on Deposit in the New England Trust Company	102 75
Received from Annual Dues	5405 00
Total	$12,656 49

DISBURSEMENTS.

1887.				
July	22.	Check No. 34. Virgil Coblentz, Committee on Papers and Queries		$9 50
	25.	Check No. 35. The Guarantee Company of North America, Premium on Treasurer's Bond		50 00
August	4.	Check No. 36. Joseph L. Lemberger, Auditing Committee		42 35
	10.	Check No. 37. Frank Wood, Stamped Envelopes, Printing, etc.		12 00
	17.	Check No. 38. P. Wendover Bedford, from Centennial Fund for Formulary Committee		20 00
	29.	Check No. 39. John J. Johnson, legal advice		10 00
		Check No. 40. Charles A. Tufts, sundry expenses		72 97
September	7.	Check No. 41. John M. Maisch, sundry expenses		70 28
		Check No. 42. Charles Rice, from Centennial Fund for Formulary Committee		37 75
September	7.	Check No. 43. George W. Kennedy,		
		Salary as Secretary of Council	50 00	
		" Chairman of Committee on Membership	150 00	
		Sundry expenses	7 35	
				207 35

September	7.	Check No. 44.	Block Publishing & Printing Company, printing.		$12 50
		Check No. 45.	Emlen Painter, Committee on Papers and Queries		33 60
		Check No. 46.	George W. Voss, Local Secretary,		
			Rent of hall at Cincinnati	226 75	
			Sundry expenses	10 00	
					236 75
		Check No. 47.	C. Lewis Diehl, Salary from September 1886, to September, 1887		750 00
	27.	Check No. 48.	Emlen Painter, Ebert Prize		24 00
		Check No. 49.	John M. Maisch, traveling expenses		47 50
	29.	Check No. 50.	Life Membership Fund Investment		4000 00
		Check No. 51.	Cyrus R. Morgan, stenographic report.		150 00
		Check No. 52.	Stettiner, Lambert & Co., Formulary Committee		40 00
		Check No. 53.	S. A. D. Sheppard, sundry expenses		117 88
November	5.	Check No. 54.	Standard Publishing Company, printing and stationery		56 09
	28.	Check No. 55.	Evans' Sons & Mason, Committee on Drug Market		22 95
		Check No. 56.	Winkley, Dresser & Company, stamped envelopes, printing, etc.		47 92
1888.					
January	25.	Check No. 57.	Constantin Schmidt, Formulary Committee		7 81
February	13.	Check No. 58.	Mills, Knight & Company, circulars, printing, etc.		13 50
		Check No. 59.	Charles Rice, Formulary Committee		29 94
February	17.	Check No. 60.	John M. Maisch, sundry expenses		254 54
		Check No. 61.	Inquirer Printing & Publishing Company, Proceedings		1770 10
February	25.	Check No. 62.	John M. Maisch, Pharmaceutical Journal		$32 40
		Check No. 63.	American Bank Note Company, certificates		105 00
March	8.	Check No. 64.	William S. Thompson, incorporation		67 35
April		Check No. 65.	John M. Maisch, sundry expenses		32 20
May	3.	Check No. 66.	American Surety Company, premium on Treasurer's Bond		50 00
	24.	Check No. 67.	Inquirer Printing & Publishing Company, National Formulary		423 37
		Check No. 68.	Standard Publishing Company, stationery, stamps, etc		16 50
June	6.	Check No. 69.	C. F. Schluessner, National Formulary		2 45
		Check No. 70.	M. S. Woodman & Co., National Formulary		3 25
	8.	Check No. 71.	J. Milhau's Sons, National Formulary		1 25
		Check No. 72.	Chas. A. Rapelye, National Formulary		2 52
	20.	Check No. 73.	S. A. D. Sheppard, sundry expenses		51 85
		Check No. 74.	S. A. D. Sheppard, salary from Sept., 1887, to Sept., 1888		600 00
		Check No. 75.	John M. Maisch, salary from Sept., 1887, to Sept., 1888		750 00
			Total		$10280 42
			Cash on hand July 1, 1888		2376 07
					$12656 49

Of the cash in the treasury at the beginning of the year, the sum of $429.77 was, by order of the Association, placed to the credit of the account of the Committee on Arrangements.

The interest received on this amount during the year ending July 1, 1888, is $10.74.

Therefore the sum of $440.51 of the cash in the treasury, July 1, 1888, belongs to the account of the Committee on Arrangements.

The Treasurer further reports that he has credited the following amounts on the Association ledger as "By Order of Council," satisfactory evidence having been received that the several amounts had been paid.

Amasa O. Gates	1886	$5 00
Charles A. Lahme	1885	5 00
Delbert E. Prall	1883–84–85	15 00
Theodore Ricksecker	1886	5 00
Samuel L. Rumsey	1884	5 00
Mason B. Wood	1886	5 00
Charles Zimmermann	1885	5 00
Total		$45 00

The Treasurer further reports that he has received satisfactory evidence that the following named gentlemen are entitled to their resignations, to date from the years set opposite their respective names, and he recommends that the Council so order.

Clarence E. Browne	1884
Geo. H. Lohman	1884
Herman T. Eberle	1885
Bayard T. Perry	1883
Peter P. Sutton	1884
Geo. S. Wanier	1886
John A. Webb	1885
Albert Weiser	1885

The sum of $1385.00 is due the Association from members whose names will probably be dropped from the roll this year for non-payment of dues.

Not counting the above mentioned amount, the prospective assets of the Association are as follows:

Annual Dues for 1883	$10 00
" " " 1884	85 00
" " " 1885	245 00
" " " 1886	545 00
" " " 1887	930 00
" " " 1888	3400 00
Total	$5215 00

Signed, S. A. D. SHEPPARD, *Treasurer.*

Boston, July 1, 1888.

Report of the Treasurer compared with the books, and are in accord.

M. W. ALEXANDER, *Ch. Ex. Com.*

St. Louis, July, 1888.

Mr. Maisch read the following:

REPORT OF THE COMMITTEE ON PUBLICATION.

The instruction received at the Providence meeting, to publish the Proceedings of the annual meeting on or before the following first day of January, has been complied with as nearly as possible after the Council had authorized, by a vote passed December 22, the omission of the Formulary from the volume for 1887, of which 1650 copies were printed. The books were distributed by mail or express, on January 25 and 26.

The expenses for publishing and distributiug the Proceedings—a volume of 749 pages —were as follows:

Proceedings, Phonographic report	$150 00	
Composition, paper, and press-work	1431 10	
Reprints of papers, queries, by-laws, etc	17 00	
Binding and wrapping	318 00	
Freight	4 00	
		$1920 10
Journals for use of Reporter for 1887	32 40	
1888	12 25	
		44 65
Other expenses of the Secretary, Woodcuts	14 50	
Telegrams	2 00	
Circulars	29 50	
Stationery	7 00	
Packing boxes	3 00	
Freight and expressage	79 84	
Postage stamps	193 93	
		329 77
Salaries of Reporter and Secretary		1500 00
Total		$3794 52

The stock of Proceedings on hand and stored at the Philadelphia College of Pharmacy is as follows:

1851.	290	in paper.				1871.	93	in paper	54	bound.
1852.	76	"				1872.	102	"	—	"
1853.	76	"				1873.	16	"	94	"
1854.	49	"				1874.	130	"	18	"
1855.	92	"				1875.	54	"	51	"
1857.	241	"	15	bound.		1876.	42	"	49	"
1858.	54	"	4	"	125 loose.	1877.	48	"	88	"
1859.	—	"	31	"		1878.	58	"	113	"
1860.	—	"	195	"		1879.	22	"	94	"
1862.	—	"	271	"		1880.	82	"	41	"
1863.	—	"	259	"		1881.	51	"	30	"
1864.	175	"	107	"		1882.	51	"	78	"
1865.	150	"	18	"		1883.	44	"	130	"
1866.	67	"	70	"		1884.	54	"	203	"
1867.	146	"	79	"		1885.	113	"	240	"
1868.	52	"	143	"		1886.	66	"	280	"
1869.	97	"	138	"		1887.	60	"	207	"
1870.	107	"	87	"						

The insurance on the above and other books remains the same as for a series of years past, it being $2500, in the German Fire Insurance Company of Philadelphia, at a premium of $15.

For many years past it has been customary to send the Proceedings by express to the authorized agents, for delivery to the local members entitled to the book. This has been done with the view of curtailing expenses, and through this labor of the agents the Association has annually saved from $100 to $120. The inconveniences of this system of distribution and the unavoidable delay occasioned thereby, more particularly in the large cities, render a change desirable. While in a few instances it may be still preferable for various reasons to send some volumes by express, the Committee propose that the Council direct, *as a general rule*, the distribution of the Proceedings *by mail* to all the members entitled thereto.

If the Council approves of this proposition, it will be necessary for the Permanent Secretary to issue special notices, previous to the publication of the next volume, to every contributing member, in relation to Chapter VI., Article IX., and Chapter VIII., Article III., of the By-laws, and to all members in relation to the necessity of communicating *without delay* all changes of address, in compliance with a resolution passed twenty-two years ago, as follows (see Proceedings 1866, page 66):

Resolved, That it is the duty of all who apply for membership in the Association to see that their names are correctly and plainly written and their post-office address correctly given. The Association will hereafter not be responsible for mistakes in the certificates or in the roll of members which occur through want of care in forwarding full and correct names and changes of address; nor will the Association hereafter replace volumes of Proceedings lost through change of residence of which the Permanent Secretary shall not have been duly notified.

The National Formulary was omitted from the last volume of Proceedings in accordance with the following resolution passed by Council, December 22, 1887:

WHEREAS, It appears from a report of the Editing Committee that the publication of the National Formulary cannot be properly accomplished before March next; therefore,

Resolved, That the Permanent Secretary be instructed, 1st, to issue the Proceedings for 1887 as soon as finished, without the Formulary; and, 2d, to send, when ready for issue, a bound copy of the Formulary to every member not in arrears with the annual dues.

Resolved, That the publication of the Formulary with the Proceedings of 1888 be referred to the Association for decision at the next annual meeting.

The time named by the Editing Committee, March 1st, was insufficient for properly finishing the work, and it was not until May 14 that the last proof was received by the printer, and May 30 that he was notified of no further changes being required in any one of the plates.

In accordance with instructions received, the contract for type-setting and stereotyping was awarded to the lowest and best bidder. Estimates having been obtained from different firms in Philadelphia, Lancaster, Pa., New York, and Boston, the Inquirer Printing and Publishing Company, of Lancaster, Pa., was found to have offered the best terms, as was also the case with the estimates for press-work, paper and binding, which were procured during the latter part of April.

The Formulary was ready for distribution to the members July 2 and 3, when the supplying of dealers was likewise commenced. Members who had paid their dues for the year 1887 received a copy directly by mail, while those who at that time were in arrears have been or will be furnished with it as soon as notice is received from the Treasurer that the arrearage has been paid.

The Committee was also charged with the duty of putting the "National Formulary" on sale in the various cities of the United States *at the lowest price possible after paying all necessary expenses.* It was decided by the Committee to enlist the co-operation of the authorized agents of the Association in the sale of the work, and to give wholesale druggists, booksellers, and other dealers, the opportunity of procuring it at the same price. In order that the book could be sold at a uniform price in all parts of the country, it was arranged that the wholesale price, freight included, be uniform to all dealers, and irrespective of quantity, and that accounts be settled by remittance on receipt of goods, or within ten days of shipment. These conditions being kept in view, the wholesale price per copy bound in cloth, was fixed so low that the calculated profit to the Association on the cost of paper, press-work, binding, and shipping, would amount to somewhat less than four cents each on the first 3000 copies, and to about 11 cents each on the first 6000 copies sold. The calculations for the other styles of binding were made similarly close. The average profit per copy will probably be somewhat greater, and the Association will ultimately be reimbursed for all the expenses incurred in preparing and publishing the Formulary.

The first edition of 3000 copies was put on the market July 2, and was completely exhausted in ten days. The second edition of 3000 copies was shipped from July 31 to August 8; and the third edition of the same number began to be shipped August 31st. The rapid disposal of the Formulary rendered the Committee unable on both occasions for two or three weeks to supply the work either upon orders or to members who in the meantime had paid up their dues for 1887.

The stereotype plates, together with printed sheets and books, while in custody of the printer and binder, have been insured in the Reading Fire Insurance Company to the amount of five hundred dollars, at an annual premium of one per cent. ($5.)

In compliance with the instructions received from the Council, application for copyrighting the National Formulary was made in due time, and on the 22d day of June, the copyright was granted to "The American Pharmaceutical Association."

Respectfully submitted,

C. LEWIS DIEHL,
ALBERT E. EBERT,
LEWIS C. HOPP,
JOHN M. MAISCH,
J. U. LLOYD.

The report was accepted, referred to the Association, and, on motion of Mr. Sheppard, the recommendation in regard to the distribution of the Proceedings was adopted.

On motion of Mr. Diehl, it was ordered that the Examining Committee, at the time of examining the Treasurer's books, also examine the Permanent Secretary's books in regard to money handled by him in connection with the National Formulary.

Mr. Finlay was appointed a Committee to examine the Permanent Secretary's Report on Credentials, which, being found correct, was subsequently accepted. (See page 17.)

Mr. Kennedy, Chairman of the Committee on Membership, read the report of that Committee, which, on motion of Mr. Alexander, was accepted and referred to the Association.

REPORT OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association:

GENTLEMEN.—Your Committee, through its Chairman, would respectfully submit this their annual report for your disposal.

In compliance with instructions from the Council at the Tenth Session, held September 7th, 1887, to refund $2.00 to all members who were elected under the old system, this amount has been returned to the following, which includes all entitled to receive it:

S. S. Jones, Wilkesbarre, Pa.
E. Kremers, Milwaukee, Wis.
E. G. Eberhardt, Indianapolis, Ind.
Jas. M. Tobin, New Jersey.
Wm. Aird, Jacksonville, Fla.
Wm. A. Richardson, Boston.
Wm. B. Krosskop, Oil City, Pa.
Ed. A. Warren, St. Paul.
Wm. H. Niblo, East Orange, N. J.
Chas. G. Baier, Detroit, Mich.

Wm. Simonson, Cincinnati.
Fred. W. Jillson, Attleboro, Mass.
H. K. Appleton, Boston.
Ferd. T. Schmidt, New York.
H. C. Cook, Columbus, O.
Oscar M. Wight, Indianapolis.
S. W. Williams, New York.
Edward J. Finnerty, Centrālia, Pa.
John K. Young, Bristol, Pa.
A. E. Brown, Mobile, Ala.
Benj. Ward, Mobile, Ala.
A. L. Metz, New Orleans, La.
Jno. Johnson, New Orleans, La.
Henry C. Cushman, Pensacola, Fla.
Chas. H. Butler, Oswego, N. Y.
R. D. Peyton, Louisville, Ky.
I. M. Hodgkins, Scottdale, Pa.
Jno. F. Zuenkeler, Cincinnati, O.
Rich. D. Collins, Crittenden, Ky.
Alfred DeLong, Cincinnati, O.
Edward L. Pieck, Covington, Ky.
D. S. Carraway, Chattanooga, Tenn.
Jno. Weyer, Cincinnati, O.
Emil A. Fischer, Cleveland, O.
M. A. Burkhardt, Dayton, O.
T. D. McFarland, Canton, O.
Willis H. Albro, Medina, O.
J. F. Hahn, Cleveland, O.
James Kennedy, San Antonio, Tex.
DeL. Haigh, St. Louis, Mo.
J. L. Hill, Williamsport, Pa.
Theo. F. Norwood, Cincinnati, O..
Geo. Hughes, Jacksonville, Fla.
Lorren S. Vincent, Dayton, O.
Chas. M. Ford, Denver, Col.—45.

Your Committee would also report, in accordance with instructions to notify all members of the Association of the change made in obtaining new members, that the Chairman, in August of the present year, sent out an explanatory circular.

The circular has informed many members of the change made in receiving new members, perhaps quicker and in a more satisfactory manner than by any other means. It will also, no doubt, shorten the time, when the work of the Chairman will be less laborious than it was during the past year, the increased labor being due, principally, to writing letters of explanation in regard to the new system now in use of electing members. The circulars have been used to good advantage by some members, by filling up the form of proposition for membership with names of persons who are eligible to become members. Quite a number of these have been received.

Under the new method of obtaining members into our Association, there were recommended in all at Cincinnati 436, from the states of Arkansas, California, Georgia, Iowa, Kentucky, Louisiana, Illinois, Massachusetts, Michigan, Minnesota, Nebraska, New York, North Carolina, Ohio, Pennsylvania, Tennessee, and Wisconsin—251 coming from Michigan. Up to this date but thirty-three have made their membership good.

Shortly after adjournment the following letter was mailed to each person recommended:

Pottsville, Pa., *September* 26, 1887.

Mr. ——— ———.

Dear Sir: At the last meeting of the American Pharmaçeutical Association, held in Cincinnati, September 5th, 1887, you were elected a member under the provisions of the new By-laws. Your membership will be completed by signing the enclosed blank form, and sending the same with the annual contribution for the current year (five dollars), to the undersigned. There is no other expense, unless you wish to obtain also a Certificate of Membership, which will be furnished by the Treasurer, Mr. S. A. D. Sheppard, 1129 Washington street, Boston, Mass., on receipt of $5.00 or of $7.50, the former being on paper, the latter on parchment.

The Proceedings annually published by the Association, make a volume of about 650 or 700 pages, which constitutes a valuable record of the progress of pharmacy during the year, and will be sent free of charge to every member in good standing.

The action of the Association in electing you a member is prompted by the desire to have upon its roll the names of such American Pharmacists of distinction and merit as would be a credit to the Association, thereby increasing the usefulness of this national organization, which can point with pride to its honorable record.

Hoping to receive an early answer, I am yours truly,

——— ———,

Chairman Committee on Membership.

Since the publication of the Proceedings for 1887, the following gentlemen proposed at the Cincinnati meeting have completed their membership:

Wm. H. Allen, Detroit.
Chas. L. Ashbrook, Ada, O.
Gaston E. Bacon, San Francisco.
Howard M. Church, Holly, Mich.
Chas. M. Greve, Cincinnati.
Frank Inglis, Detroit.
Rudolph E. Rhode, Chicago.
Wm. E. Sheffield, Vestaburgh, Mich.
J. G. Spengler, Dayton, O.
Arthur P. Wilkes, St. Paul, Minn.

The names of persons recommended should be written legibly, and the number and street should be furnished as far as possible, especially if the person resides in a city, as quite a number of the notices sent out were returned as not found. Members should also be careful not to recommend those for membership who are already members of the Association, as had been done last year.

REPORT OF MEMBERSHIP.

Members in good standing at last report	1291
" elected at last meeting (1887)	52
" received as delegates	19
Became members under the new system since last meeting	33
Total membership	1395

LOSS IN MEMBERSHIP.

By resignation	59	
Dropped from the roll for various causes	58	
By death	21	
Total loss		138
Number in good standing at this report		1257

HONORARY MEMBERSHIP.

Number on the roll same as at last report	25

I present 168 names of delinquent members, reported by the Treasurer, who are liable to be dropped from the rolls. Of this number are in arrears 67 for 3 years, 48 for 4 years, 48 for 5 years, 4 for 6 years, 1 for 7 years.

The Treasurer says that he has reason to hope that most of them will pay up.

The mournful duty of dropping from the roll of membership, the names of some esteemed and useful associates, who have been called to exchange time for eternity, again devolves upon your committee. The summons from the great Master of Rolls has come to an unusually large number during the year, and as we read the list, we note that among those who have been called away are four of our ex-Presidents, which leaves remaining with us only 20 ex-presiding officers of our Association, a solemn reminder of the fact that we are all steadily " moving to the pale realms of shade, where each shall take his chamber in the silent halls of death." The list of departed embraces the fol-

lowing: Hazen W. Adams, Hackensack, N. J.; James Bowker, Philadelphia; Cyrus A. Buffington, Indianola, Ia.; S. L. Coffin, New Westminister, British Columbia; Jno. H. Currie, New York; S. O. Daniels, Natick, Mass.; Wm. Johnston, Detroit, Mich.; R. F. Lattimer, Jackson, Mich.; Henry W. Lincoln, Boston, Mass.; Gustavus J. Luhn, Charleston, S. C.; Roderick McLeod, Quebec; Dr. J. Faris Moore, Baltimore; James Morgan, Carl Junction, Mo.; Robert E. Parsons, Orange, N. J.; George D. Randall, St. Johnsbury, Vt.; Randal Rickey, Trenton, N. J.; D. C. Robbins, New York; Joseph Roberts, Baltimore; Theodore Ronnefeld, Detroit, Mich.; Lorren S. Vincent, Dayton, O.; Joseph T. Webber, Springfield, Mass.

Hazen W. Adams, of Hackensack, N. J., died there suddenly of apoplexy. At the time of his death he was 63 years old. After passing through the common schools, he was sent to Dartmouth College, remaining in this institution until he graduated, which he did with high honors. He afterwards studied medicine, and two years afterwards, in the year 1849, went to California, where he remained 10 years. He next located in Hackensack, N. J., as a pharmacist, and conducted business there the rest of his life. He died April 8th last, much regretted by the towns people as an honest, unostentatious, genial man. He was of a very gentle and retiring disposition, attending strictly to his duties as a husband, father and pharmacist. Deceased became a member of our Association in 1879, at the meeting held in Indianapolis.

James Bowker, of Philadelphia, died there after a short illness. Mr. Bowker was born in Oldhouse, England. He learned the drug and apothecary business in his native town, afterwards came to this country about twenty years ago. He studied medicine at the University of Pennsylvania, graduating two years later. He subsequently went into the drug business at the corner of 6th and Vine Sts., and was very successful, accumulating quite a competency. He died without a relation so far as is known in this country; his mother still lives at his native town of Oldhouse, England. Deceased connected himself with our Association in 1876, at Philadelphia.

Cyrus A. Buffington died at his residence in Indianola, Ia., December 17, 1887, after a brief illness. He was born in Edwardsville, Ills., June 12, 1841, and was consequently in his 47th year when he died. At the age of fifteen he commenced the drug business, clerking for his father at Jerseyville, Ills. He remained in the same store as apprentice for about 12 years, afterwards elerked 5 years for Boyer & Montgomery, Quincy, Ill., also held responsible positions in good houses in St. Louis, Chicago, and Indianapolis, and for the last 10 years had been in business on his own account in Indianola, Ia. He was an accomplished pharmacist, and in a remarkable degree thorough and careful in his business, his store in Indianola having the reputation of being the most cleanly and carefully arranged store in the city. He would handle only drugs and medicines of the best quality, and was particular in buying of such houses only upon whom he could rely as to the quality of goods they sold him. Mr. Buffington was a charter member of the Iowa State Pharmaceutical Association, and was elected a member of the American Pharmaceutical in 1880, at the meeting held in Saratoga.

S. L. Coffin, of New Westminister, British Columbia, formerly of Chicago, Ill., died in the former place in December last. For several years he was in business in Chicago, and when he removed to British Columbia, conducted a pharmacy there with success. He became a member of our Association at the meeting held in Indianapolis in 1879.

Jno. H. Currie, of New York City, a life member (old style) of our Association, died at a ripe old age in February last, aged 82 years. He began the study of pharmacy in the drug store of J. M. Bradhurst & Co., where he remained many years, after which he began the manufacture of chemicals, which he conducted for nearly or quite 30 years. He was among the first to produce morphine on a large scale, and he enjoyed an excellent reputation for his products. He retired from their manufacture over 25 years ago. As a man, he was genial and interesting; in his business career, he was noble, generous, and a consistent merchant. He leaves a widow, but no children, to mourn his loss. Deceased became a member of our Association in 1858, at the meeting held in the city of Washington, D. C.

S. O. Daniels, of Natick, Mass., died there suddenly of apoplexy the 28th of March, 1888. Deceased carried on the apothecary business in Natick for many years, where he was honored and respected by all who knew him. For several years he was largely interested in the Electric Light Company in Natick and South Framingham. A wife—he leaves no other family—mourns his loss. Deceased's connections in our Association date back from the meeting in Boston in 1875.

Wm. Johnston, of Detroit, Mich., was drowned in the Detroit river on the 6th day of March last, while attempting to make his way in an open boat from his residence on Grosse Isle to Ontario. The river was filled with floating ice, and the accident was in consequence of this fact. It was not until the 2d day of May, nearly two months after, that the remains of the deceased were found. Mr. Johnston was born in Boston about fifty years ago. When seven years old he moved with his parents to Toronto, and soon thereafter was thrown entirely upon his own resources by the death of his parents. The fact that he at once apprenticed himself to a pharmacist seems to indicate that his choice was instinctive, and certainly his later career of nearly forty years of success as a pharmacist but emphasizes the wisdom of his boyhood selection. In 1857 he went to Detroit, being at that time 19 years old, to take a position with Henry Haigh, who conducted a store at the corner of Jefferson avenue and Brush street. After a few years' service in Mr. Haigh's employ, he accepted a position with Higby & Stearns, with whom he remained until the spring of 1860, when he began business on his own account on Griswold street. Just beyond his majority in years, young Johnston had displayed such sterling business qualifications, and his devotion to his profession was so thorough, that besides having the confidence of the medical profession, he began business with a liberal and rapidly increasing patronage justly his own, which put him on the high road to success. He continued business at this place until about 1878, and at one time he had no less than five branch stores, all of which were managed by former clerks. Mr. Johnston, although slight in stature, was a man of strong physical characteristics, his energy and unlimited capacity for work being backed by mental characteristics equally strong. He was one of the early members of the Detroit Board of Trade, one of the original contributors to the stock of the Detroit Medical College. He was an active member of the Michigan State Pharmaceutical Association, and in 1860 he became a member of our Association in the city of New York. Deceased leaves one son and three daughters.

R. F. Lattimer, of Jackson, Mich., died very suddenly of heart disease. Mr. Lattimer was born 57 years ago, at Chesterfield, Conn. He began his business career when quite a young man, by entering the drug store of Horace G Bliss. After serving his apprenticeship he went into business for himself, by forming a co-partnership with S. Holland, and the firm of Holland & Lattimer did business for many years. He afterwards engaged in the drug business alone, and established a very successful trade. In 1868, he moved to Westerly, R. I., where he engaged in the manufacturing line. In 1883, he removed to Stockbridge, Mich., where he engaged in the drug trade and also embarked in the banking business; later on he went to Jackson, and purchased an interest in the drug firm of E. J. Weeks & Co., the firm name being changed to Weeks, Lattimer & Co. Mr. Lattimer attended to his duties in the store assiduously, always on duty and always with the uniform kindness and geniality that marked a trait in his character. He was of an enterprising character, and took an active interest in all movements having an influence to benefit the place where he resided. Liberal and progressive in his ideas, suave and cordial in manner, of scrupulous honor, his probity was never questioned. He was President and founder of Jackson County Pharmaceutical Association. Deceased united himself in membership in our Association in 1857, at Philadelphia.

Henry W. Lincoln, a life member (old style) of our Association, of Boston, Mass., died September 12, 1887, of paralysis. Deceased was born in Highland, Mass., in the year 1822, and was therefore, at the time of his death, in his 65th year. He was a man of great refinement and the broadest reading. He was very active in his profession as a chemist, and made a specialty of the study of botany, in connection with which subject he collected a valuable library. He was a graduate of the Massachusetts College of Pharmacy and Secretary of the College for 23 years, from 1851 to 1874, and served as trustee for three years following. He was elected President of our Association at the meeting in Boston in 1865. He was well-known as a pharmacist by his contributions to pharmaceutical journals, and he was always active in the practical pursuit of his profession. Deceased was one of the oldest members of our body, having been elected at the meeting held in Boston in 1853.

Gustavus J. Luhn, of Charleston, S. C., died there April 4th, aged 49 years. Mr. Luhn was born June 7th, 1839, at Genthin, in Saxony, and at the age of eighteen came to this country, first locating in New York city, but later at Richmond, Va., and subsequently settling in Charleston, S. C., in 1868; and as he was a man full of energy, excellent business traits, a reputable pharmacist, he soon secured a goodly share of business patronage, and since he located in Charleston, has always maintained a good reputation as an honorable and conscientious citizen. He was beloved and respected by all who knew him, and will be missed by many, especially the poor, to whom he was exceedingly kind and charitable. By Mr. Luhn's efforts was secured the organization of the South Carolina Pharmaceutical Association, and also the enactment of a State pharmacy law. On the examining board he has served almost continually, and acted as its secretary for many years. Many of our readers, no doubt, will recall the interesting account he gave of the earthquake, which appeared in the pharmaceutical journals. In that disaster his own store suffered greatly. Deceased was elected second vice president at the Philadelphia meeting in 1876, and two years later at the meeting in Atlanta, President of our Association. In the year 1873 he became a member of our organization, at the meeting in Richmond.

Roderick McLeod, of Quebec, died in New York, May 1st last, of spinal meningitis. Deceased was a man of rare literary ability, and a most excellent pharmacist, and held a high place in the esteem of many of Quebec's best citizens. For several years he had been troubled with bronchial affections, and had spent a good part of the severe winters in the South, generally in Florida. He was on his return home, but staying a few days in New York city, when he suddenly became ill. He was found insensible in his room on the morning of April 26th, recovered his consciousness two days, but bodily suffering was great until he was relieved by death. He was prominent in the circle of pharmacists of Quebec, a genial, unassuming, but most estimable gentleman. Deceased became a member of our Association in 1880, at the meeting held at Saratoga Springs, New York.

Dr. J. Faris Moore, of Baltimore, Md., died of congestion of the brain on the afternoon of February 3d, 1888, at his residence. Dr. Moore was born at Port Penn, New Castle county, Del., February 20, 1826, and would have been sixty-two years of age in a few days more. His boyhood was spent at Elkton, Cecil county, where he was educated. He removed to Baltimore in 1842, and entered the pharmaceutical establishment of the late Dr. George W. Andrews. He remained with Dr. Andrews six years, making himself thoroughly familiar with the business, and graduated from the Maryland College of Pharmacy in 1847, after which he went to Wilmington, Del., where he established himself in the drug business, in which he continued for about three years. He also studied medicine while there, and graduated with honor at the Jefferson Medical

College, Philadelphia, in 1849. He then returned to Baltimore, and opened the drug store at the corner of Howard and Madison streets, in connection with J. K. B. Emory. The partnership was dissolved in 1858. Deceased was one of the corporators in the reorganization of the Maryland College of Pharmacy, and was its first Secretary. March 12th, 1861, he was elected Professor of Pharmacy in the same institution, and subsequently Professor of Materia Medica. On the resignation of the late Geo. W. Andrews as President of the College, January 11, 1872, Dr. Moore was elected as his successor, and held the position for three years. He served twice on the Committee for the revision of the National Pharmacopœia. He was honorary member of many of the Colleges of Pharmacy and State Associations. In 1870 the Maryland College of Pharmacy conferred upon him the degree of Doctor of Pharmacy for his deserving original work, and research in the service of pharmacy. Deceased was married to Miss Mary E. Riel in 1853, who died in 1866. They had 3 children, but only one son Clarence is now living, who succeeds his father in business. Dr. Moore served this Association as its presiding officer in 1863 and 1864, and became a member of the Association in 1856.

James Morgan, Carl Junction, Mo., died in Longton, Elk Co., Kansas. Mr. Morgan was a life member (old style) of our Association, and for a number of years prior to his death was unable to attend to business on account of failing health. He was a pharmacist of more than ordinary ability, and was considerably interested in the direction of anything that would tend to elevate the profession. He was one of the old members of our Society, having joined the Association in 1859, at the meeting held in Boston.

Robert E. Parsons, of Orange, N. J., proprietor of the Music Hall Pharmacy, died suddenly at his home, February 2, 1888. Mr. Parsons had been in delicate health for a long time; his complaint was hemorrhage of the lungs. Nearly every winter he made trips to Florida, generally returning much invigorated, and looking well. Mr. Parsons was born February 16, 1850, at Milbrook, a small town near Morristown, N. J., and when quite a young man entered the pharmacy conducted and owned by Mr. Dalrymple, in Dover. When 19 years old he went to Orange, and at once obtained a position with B. E. Smith, the leading druggist of the city. Here he remained after the death of Mr. Smith in the employ of his brother, J. H. Smith, until 1873, when he started in business for himself on Main street in the Mandeville building; later on he removed his stock to Music Hall, and remained there up to the time of his death. Mr. Parsons was one of the best known men in the city and vicinity where he lived. He was a person that cared very little for fame, and the only political position he ever held was Chosen Freeholder, which he filled at the time of his death. It was his genial temperament, his frank, almost boyish and winning manner, that made him a favorite among his associates; and these qualities, combined with business enterprise, his reliability and integrity as a man, made him exceptionally popular among all classes. His business success was due to his own indomitable energy, enterprise and business sagacity, by means of which alone he rose to the enviable position he held among the business men of Orange. He leaves a wife, but no children. Deceased became a member of our Association at the meeting held in Toronto, Canada, in 1877.

George D. Randall, of St. Johnsbury, Vermont, died June 14th, from the effects of a stroke of paralysis. Mr. Randall was in his forty-second year at the time of his death. He studied the apothecary business in his youth, and was for a long time in the employment of his father, finally succeeding him in the business, which gradually became a very large one, his customers coming from all parts of the county in which he resided. He leaves a widow and two children to mourn the loss of a good husband and a kind and indulgent father. Deceased was not only a good business man, but also considered one of the best pharmacists in the county where he lived, a man of untiring industry and of good jndgment. Out of respect to deceased, a number of his brother druggists from different parts of the State were present at the funeral, and in a body viewed the remains. Mr. Randall was elected a member of this Association at the meeting held in Boston in 1875.

Randal Rickey, one of the oldest druggists of Trenton, N. J., died suddenly at his home, of apoplexy, December 2, 1887, at the age of 64. Mr. Rickey was, in the broadest sense, an apothecary. Succeeding his father in business in his native city more than forty years ago, he continued in it all his life. It gave him pleasure to tell that he made plasters and pills after the old style for his father, before and after school hours when but a small boy, besides attending to other duties about the shop, but at the time of his death he was fully up to modern pharmacy. He was one of the organizers of the New Jersey Pharmaceutical Association, was its president in 1878, and was generally present at the annual meetings. In his manner he was exceedingly quiet and unobtrusive, and his judgment could be relied on. In his business dealings he was strictly upright. He served several terms in the Councils of the city of Trenton. He contributed largely for charitable objects, usually in an unobserved and quiet way. A wife and daughter survive him. He frequently attended the annual meetings of our Association, of which he became a member in 1870, at the meeting held in the city of Baltimore.

Daniel C. Robbins, of New York city, died very suddenly, April 15th last, of heart disease. Mr. Robbins was of Quaker origin, born at Roslyn, N. Y., in 1815; and after service in a retail drug store in Poughkeepsie, went to New York city and entered the employ of Olcott & McKesson, then a young drug house in Maiden Lane. Pursuing his studies at the New York College of Pharmacy, he graduated in 1836. His close attention to business and his manifest ability were early recognized by the firm, and he was admitted as the junior partner, and after the decease of the senior partner, the firm name was changed to that so well known for the past twenty-five years, McKesson & Robbins. Mr. Robbins was a man of wonderful energy and decision, inclined to urge his views with pertinacity, because convinced of the correctness of his judgment. As a business man his views were respected, and when they differed from others, he seldom gave way to opposing opinions. He was identified with many literary, business and benevolent enterprises, and was a liberal benefactor when his sympathies or interests were awakened. He took part in the organization of the Alumni of the New York College of Pharmacy, and served as its president, continuing a second year, and aiding greatly in its success. The wholesale drug trade, at a meeting called by Mr. G. W. Olcott, passed resolutions of sympathy to his family, expressing their appreciation of his integrity and honor as a business man, the various members present adding their personal testimony of esteem to his memory. Mr. Robbins was elected a member of our Association in 1862, at the meeting held in the city of Philadelphia.

Joseph Roberts died suddenly at his home in Baltimore, Tuesday afternoon, January 31st, 1888, in the 64th year of his age. He was born in that city February 15, 1824. Having received a good preparatory education at West Nottingham Academy, young Roberts determined to equip himself for the drug business. Not being content with only such knowledge as could be simply obtained behind the counter, and at that time his native city having no college of pharmacy, he at once resolved to enter the trade in a city where he could have the theoretical as well as practical training. Consequently he first entered upon the study of pharmacy in New York with the late Mr. Jno. Milhau. This was in 1841, and with a class of three he graduated from the New York College of Pharmacy in 1845. The following year he returned to Baltimore and opened the drug store which he so successfully managed up to the time of his death. He always manifested the greatest interest in anything pertaining to his profession. While he was a student in New York the Maryland College of Pharmacy was established, and on his return home he at once became identified with it. He was always found watching the interests and advancement of the college, was its president for the last ten years, and was instrumental in having the new building erected. He was energetic in having suitable legislative enactments passed for the advancement and better practice of pharmacy in his State, and at the time of his death was busy pressing before the State Assembly a new pharmacy law to take the place of rhe old one, which he thought was not sufficient in its scope. Mr. Roberts was a gentleman apparently of the strongest physical powers. fine judgment and apt understanding. His presence always engendered respect as well as admiration, and his word was as good as his bond, and his honor his life. Mr. Roberts died of pneumonia, which came from a cold contracted while driving from Baltimore to his farm 14 miles away. He was twice Vice-President of our Association, and President for the year 1885–'86. He very seldom missed being present at our annual meetings. In 1861 he was married to Miss Carrie Hutton, of West Virginia; they had three children, but only one, a son, survives. He became a member of our Association in 1856, at the meeting held in Baltimore.

Theodore Ronnefeld, of Detroit, Mich., was born in Salis, near Leipzig, Saxony, in 1833. His father and grandfather both were physicians. When 14 years of age, he was apprenticed to Dr. Schroeder, of Gera, an eminent apothecary. At Gera Mr. Ronnefeld remained five years; at the end of this period he passed his examinations as apothecary. Having sympathized with the revolutionary movements taking place in Germany at this time, deceased thought best to leave his Fatherland and come to New York, which he did in 1852. He found no difficulty in procuring a position as drug clerk, which he held for one year; then he went to Detroit, and secured a position as assistant in the newly opened pharmacy of Mr. Renchar. Here he remained three years, when he started in business for himself at Niagara Falls. In 1862 he returned to Detroit, and opened a pharmacy on Gratiot Avenue, a few doors below his late place of business; and though the first few years his business was anything but a prosperous one, yet he did not lose courage, but remained at his post day and night with perseverance, until he finally established a prosperous trade. During the past fifteen years Ronnefeld's pharmacy has ranked among the best equipped and best managed drug stores in Detroit. In 1881 he visited Germany, after having been absent almost thirty years. About a year previous to his death he discovered he was suffering from diabetes. In December, 1887, the first sign of disease of the lungs was detected, to which ailment he finally succombed June 6, 1888. Mr. Ronnefeld became a member of our Association at the Detroit meeting, in 1866.

Lorren S. Vincent, of Dayton, Ohio, was born in Alabama, Genesee county, New York, January 11, 1860. Eight years later he went to Layton with his parents, and in 1880 he graduated from the high school. He then entered the employ of O. P. Stafford, apothecary, whom he rendered faithful service as clerk for five years. After leaving Mr. Stafford, deceased went to Philadelphia, and entered the College of Pharmacy in that city, graduating in the spring of 1886. Thence he went to Dayton, O., where he established himself in the drug business. Here a too close application to his studies and business undermined his health to such an extent that he was compelled to give up business. During the last seven months of his illness he was entirely helpless; but he was ever hopeful and cheerful, never doubting his ultimate restoration to health. Deceased was in every respect an exemplary young man, in whose removal a family is bereft of a dutiful son and a loving brother, and a community loses a citizen of sterling worth and unexceptionable habits. Mr. Vincent was elected a member of our Association in 1887, at Cincinnati, O.

Joseph T. Webber, of Springfield, Mass., died at his home September 4, 1887; he had been sick but a few days, and his death came quite suddenly, and resulted from inflammation of the bowels. Mr. Webber was born in Holland, June 2, 1817, and attended school at Monson, and graduated from the Monson Academy at an early age. For 17 years he was in the employ of the late Horatio Lyon. In 1857 he went to Springfield, and in 1863 he went into the drug business on State street, purchasing the stock of Dr. Jno.

Hooker. In 1865 he moved to the corner of Main and State streets, fitting up a handsome store at considerable expense. He continued in business there until 1886, when he sold out, and since that time had been in no active business, Mr. Webber was a man of quiet and retiring life, devoted to his family and friends. He leaves a wife and two sons. Deceased became a member of our Association at the meeting held in Richmond, Va., in 1873.

In concluding this report, your Chairman desires to thank all the officers and members of the Association for valuable assistance received during the year, which was furnished cheerfully and promptly whenever called upon.

GEORGE W. KENNEDY,
Pottsville, Pa., August 30, 1888. *Chairman Committee on Membership.*

Mr. Sheppard presented the following letter and statement from the Chairman of the Committee on National Formulary, which were accepted. At the ninth session of the thirty-fifth annual meeting, the sum of $75 was appropriated by vote of the Association to the Formulary Committee for finishing their report (see Proceedings 1887, p, 506).

NEW YORK, *August* 30, 1888.

S. A. D. Sheppard, Esq., Treasurer of the Amer. Pharm. Association.

Dear Sir: On looking over the expenses incurred by the National Formulary Committee during the period intervening between the Annual Meeting of 1887 and 1888, I find that, while the largest proportion is chargeable to the approprtation of $200,00 for the exhibit of specimens, a portion is really chargeable to necessary expenses of the Committee, irrespective of the exhibit, and that the total exceeds the sum of $200 appropriated for the former purpose. As there was no special appropriation made for the "ordinary expenses" of the Committee, I would suggest that authority be asked for from the Council to charge the excess to this account, so that the entries will be as follows:

1. Committee on National Formulary, general expenses	$18 10
2. Special appropriation of $200, for specimens; expended	197 87

Regarding the item in my bill of Aug. 28th: "Services of Clarence Fountain," etc. I would say, that I employed him for some time to receive, prepare for exhibition, etc., the specimens sent by members of the Committee or others, and those made by myself. He also did all the work required in arranging, checking, preparing the bottles in which they were to be exhibited, labelling and packing. I think that he fully earned the amount asked for. (He also helped me during the printing.)

Very truly yours, CHARLES RICE.

SUMMARY OF EXPENSES OF NATIONAL FORMULARY COMMITTEE.

	May	10.	Bill of C. T. Schleussner,	specimens	$2 45
		24.	" " M. S. Woodman & Co.,	"	3 25
		31.	" " Ch. A. Rapelye,	"	2 52
		28.	" " J. Milhau's Son,	"	1 25
		31.	" " Jos. P. Remington,	"	22 16
Included in Chairman's bill of June 25.	June	20.	" " M. A. & C. A. Santos,	"	1 50
		20.	" " Thos. D. McElhenie,	"	2 25
		13.	" " A. H. Hollister,	"	4 54
		1.	" " Theod. Louis,	"	55
		1.	" " A. B. Stevens,	"	6 80
Chairman's bill of Aug. 17.	July	7.	" " J. M. Good,	"	4 75
	June	1.	" " Chas. Caspari, Jr.,	"	3 25
	July	1.	" " J. Milhau's Son,	"	2 50

Aug. 15.	Bill of Whitall, Tatum & Co.,	glassware	$57 11
Aug. 20.	“ “ “ “	“	2 50
Aug. 23.	“ “ “ “	“	10 23
Aug. 25.	“ “ D. L. Cameron,	specimens	3 40
July 5.	“ “ E. M. Wells,	“	3 20
June 25.	“ “ Charles Rice, expenses for proofs, revises, postage, express, etc., to June 25		18 10
	Express on samples		3 80
	Expenses of members, specimens (see above).		
Aug. 28.	“ “ Charles Rice, expenses for postage, express, messengers, etc., to date		16 90
	Charles Rice, expense for packing material, etc.		7 50
	Charles Rice, telegrams		1 50
	Charles Rice, express of 5 boxes to Detroit		9 00
	Charles Rice, bill of Cl. Fountain for services		25 00
			$215 97

Of this sum, the item of $18.10 on bill of June 25, is chargeable to general expenses. Hence, the amount chargeable to the appropriation of $200.00 for specimens is $197.87.

The Treasurer presented a list of the names of members which are recommended to be dropped from the roll for non-payment of dues. On motion of Mr. Kennedy, action was deferred till a subsequent session.

It was moved by Mr. Alexander, seconded by Mr. Maisch:

WHEREAS, The Treasurer reports that he has received satisfactory evidence that the following named gentlemen, Clarence E. Browne, Herman T. Eberle, Geo. H. Lohman, Bayard T. Perry, Peter P. Sutton, Geo. S. Wanier, John A. Webb and Albert Weiser, are entitled to their resignations to date from the years 1884, 1885, 1884, 1883, 1884, 1886, 1885, 1885, respectively, and he recommends that the Council so order; therefore,

Resolved, That this recommendation of the Treasurer be accepted, and the Treasurer is hereby instructed to make the proper entries to that effect on their several accounts.

The resolution was adopted. Also the following, which was proposed by Mr. Sheppard:

Resolved, That the resolution of March 21, 1887, found in 1887 Proceedings, page 455, by which the Treasurer is instructed to furnish with his annual report an alphabetical list of the names of the members from whom he has received dues, and subsequently a supplemental list to embrace like payments made between the close of the fiscal year and the adjournment of the annual meeting for publication in the Proceeedings, be and the same is hereby repealed, and in lieu thereof the following shall be added to the General Rules of Finance:

Rule 12. The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

It was moved by S. A. D. Sheppard that the Council recommend that the following changes be made in the By-laws of the Association:

After the third line in Article IV., Chapter VIII., as found on page 659, Proceedings 1887, add: or after twenty-five years, $30.00; or after thirty years, $20.00; or after thirty-five years, $10.00.

The motion was adopted, and the amendment referred to the Association for action.

Mr. Sheppard moved, seconded by Mr. Diehl, that the dues of William Simpson, Raleigh, N. C., for the years 1885, '86, and '87, be remitted, without the Proceedings.

The resolution was adopted, also the following, presented by Mr. Alexander, seconded by Mr. Hopp:

Resolved, That the Treasurer be instructed to credit $5.00 for 1887 dues on each of the following accounts in the Association ledger as by order of Council: Edw. S. Burnham, Augustus W. Eckel, Geo. L. Marsteller, Chas. O. Michaelis, Chas. F. Panknin, Chas. P. Aimar, it having been shown that the several gentlemen named have paid said amount to the agent of the Association in Charleston, S. C., that said agent is now deceased, and the amount still due from the administrator of the estate.

Mr. Hollister gave notice of an amendment to Chapter VIII., Article I. of the By-laws of Council, striking out the words "on the day immediately preceding that fixed for," and inserting the words "previous to." The proposition was laid over under the rules.

The Permanent Secretary stated that he had received from the former Treasurer the correspondence with members relative to waiving their right to life membership under the former Constitution and in compliance with the action of the Association in 1867 (see Proceedings 1867, page 75). On motion of Mr. Sheppard, these and other old papers belonging to the Association, and not now in use, were placed in the custody of the Permanent Secretary.

Mr. Ebert moved, as an amendment to Chapter IV., Article IV. of the By-laws of Council, to substitute the word "Secretary" for "Chairman" in said Article. The motion was laid over to a subsequent session.

After the reading and approval of the Council minutes, Mr. Ebert gave notice of the proposition of an amendment to Chapter VI., Article V. of the By-laws of the Association, adding thereto the words "the Secretary may or may not be a member of Council."

The proposed amendment was laid over; also one offered by Mr. Sheppard, simplifying the phraseology of Chapter VI., Article VIII., Section 2, by substituting for the present section the following:

"The Secretary of Council shall read at each of its sessions the names of those candidates for membership which have been proposed, and a vote of two thirds shall be sufficient to recommend them to the Association."

Mr. Painter renewed the invitation from California which had been presented for several years past, that the Association hold its next meeting in the city of San Francisco.

Mr. Sheppard moved the appointment of a large committee on the time and place of next annual meeting—twelve members to be appointed from the floor and three by the chair, the committee to give two public hearings, the decision to be final—the object being to secure a general and free expression of opinion, and to prevent interference with the general business of the Association.

Mr. Remington contended that every member present at the meeting should be given an opportunity to express his opinion and to vote on the selection of a place for holding the meeting.

Mr. Eliel thought that the Nominating Committee, being a large and representative one, could make a satisfactory report also on this question.

Mr. Hollister favored a smaller committee for this purpose.

Mr. Hechler regarded the proper way to be that it should be previously announced at which session the committee is to report, so as to secure a large attendance of members to decide the question.

The question being on Mr. Sheppard's motion, it was lost.

Mr. Painter moved, and Mr. Remington seconded, that a committee of three on the place and time of the next annual meeting be appointed to report at the second session. The motion was agreed to, and the chair appointed Messrs. Painter, Remington and Bedford said committee.

The Association then adjourned until Tuesday morning.

SECOND SESSION.—TUESDAY FORENOON, SEPTEMBER 4.

The Association was called to order by President Lloyd. The Secretary read the minutes of the first session, which were approved. Vice President Alexander occupied the chair. The minutes of the Council were read by Mr. Kennedy, and on motion were approved; these minutes give the following information:

FOURTH SESSION OF COUNCIL, SEPTEMBER 4, (9 members present.)

The propositions of 47 candidates for membership were examined, and referred to the Association.

The amendment to Chapter IV. Article IV. of the By-laws of Council to substitute the words, "Secretary of the Committee" for ",Chairman," laid over from the preceding session, was considered and adopted.

MR. EBERT moved that the Secretary be instructed to print annually in the Proceedings of the Association a list of the life members just preceding the list of contribubuting members. The motion was adopted, likewise the following, offered by Mr. Hopp:

Resolved, That the Treasurer notify each member of the Association to remit his annual dues to him on or before June 30th of each year, and if said annual dues are not paid at the time specified, the Treasurer is hereby authorized to make sight drafts for the amount in twenty days thereafter.

The list of delinquent members recommended to be dropped from the roll for nonpayment of dues, which had been laid over from the preceding session, was considered, and sixty names were ordered to be dropped.

The Secretary read the following cable message:

TO AMERICAN PHARMACEUTICAL ASSOCIATION, DETROIT.

Fraternal greetings from British Pharmaceutical Conference meeting, Bath.

F. BADEN BENGER, *President.*

A letter from Prof. Prescott was read, regretting his detention at home by the physician's order, and expressing the hope to be in the meeting on the following day.

Mr. Remington read the following, dated

VICTORIA, B. C., *September 3, 1888.*

PROF. J. P. REMINGTON, *American Pharmaceutical Association:*

Detained here. Sorry cannot be with you. Success to your meeting. Kind regards to all.

WM. SAUNDERS.

Mr. De Forest moved that the Secretary acknowledge the telegrams, with hearty good wishes of the Association. The Secretary stated that the British Conference was not now in session.* The motion was seconded by Mr. Painter, and adopted.

Mr. De Forest read the following report:

The Nominating Committee present the following names for the consideration of the Association.

President—M. W. Alexander, St. Louis, Mo.

First Vice-President—James Vernor, Detroit, Mich.

Second Vice-President—Frederick Wilcox, Waterbury, Ct.

Third Vice-President—Alvin A. Yeager, Knoxville, Tenn.

Treasurer—Samuel A. D. Sheppard, Boston, Mass.

Secretary—John M. Maisch, Philadelphia, Pa.

Reporter—C. Lewis Diehl, Louisville, Ky.

Council—Henry Canning, Boston, Mass.; Emlen Painter, N. Y.; Christian L. Keppler, New Orleans, La.

ALBERT W. P. DE FOREST, Secretary of Nominating Committee.

The report was accepted, and a ballot ordered. The chair appointed Messrs. Ingalls and Hollister tellers, when Mr. Eccles moved that the

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*This statement was erroneous, the Conference having met at Bath, September 7. Subsequently the following was sent by mail:

PHILADELPHIA, *September 17, 1888.*

MR. F. BADEN BENGER, *President British Pharmaceutical Conference*, 7 *Exchange St., Manchester.*

Dear Sir: Your cablegram extending fraternal greetings from the British Pharmaceutical Conference to the American Pharmaceutical Association, was received at Detroit on the morning of September 4, and the undersigned was directed to acknowledge the same with the hearty good wishes of this Association. Being under the impression that the Conference meeting at Bath had taken place during the last week in August, a reply by cable was not sent, and I now discharge the pleasant duty imposed upon me, with the assurance of the fraternal feelings of this Association. Our next annual meeting will take place in 1889, at a date to be announced hereafter, in the city of San Francisco, and I am sure to voice the sentiment of every member of our Association, when I assure you of the great pleasure it would afford us to welcome you and other members of the Conference at this contemplated meeting on the shores of the Pacific Ocean. I have the honor to be with great respect,

Yours very truly,

J. M. MAISCH,

Permanent Secretary American Pharmaceutical Association.

Permanent Secretary be directed to deposit an affirmative ballot for President. The ballot was cast, and a motion was made that the Permanent Secretary deposit the ballot for first Vice-President, when Mr. Diehl moved to amend that the ballot be cast for the remaining nominees. The amendment was accepted by Mr. Eccles, the motion as amended was adopted, and the ballot being deposited, the officers and members of Council nominated were declared elected.

Mr. Diehl read the names of forty-seven candidates proposed for membership, who, on motion, were elected in accordance with Chapt. VIII. Art. II. of the By-laws.

Mr. Diehl read the introductory part of the Report on the Progress of Pharmacy, which was accepted, and with the Report, referred for publication.

MR. JAMES.—The substitution by German druggists referred to in the report, was done by homœopathic druggists. I was the first, I believe, to bring that to the notice of the English druggists. It refers entirely to homœopathic pharmacists and homœopathic remedies. A job was put up by the homœopathic doctors themselves, who became convinced that their pharmacists were not putting up their remedies as prescribed, and consequently at one of their meetings they got up a list of bogus remedies, and these prescriptions were sent to the various homœopathic dispensaries; there were only twelve in Berlin who filled these bogus prescriptions; some of them were sent a second time. I don't think that this affair compromises German pharmacy as we understand it.

MR. STEWART —I have listened with a great deal of interest to Mr. Diehl's report, which mentions a subject that we are all very much interested in. I speak both as a member of the American Medical Association and the American Pharmaceutical Association. I belong to the section on pharmacy in the American Medical Association, and although I know it is not welcomed by many, all the young members of the Association certainly look upon it as a move in advance. I think if that was done, it would be equally important that a section on therapeutics be established in the American Pharmaceutical Association, so that the two professions could be brought together in both of these Associations, to discuss problems of mutual interest and importance, and in that way secure mutual benefit.

MR. REMINGTON.—Mr. President, I am very glad that this subject has been brought before the meeting; I intended to speak of it at some future time. As Prof. Diehl has remarked in his Report on the Progress of Pharmacy, there have been some active and systematic efforts made during the last year, with a view of bringing together the professions of medicine and pharmacy. We have tried for many years the policy, I might say, of non intercourse, the policy of being open or hidden enemies. A systematic effort is now being made to induce harmony of thought as well as of action between the two professions of medicine and pharmacy in this country. In our own state we have met with an astonishing amount of success. Two years ago a committee was appointed by the Pennsylvania Pharmaceutical Association to visit the Pennsylvania Medical Society. There was a good deal of discussion in the Pennsylvania Pharmaceutical Association about the propriety of sending that committee, but the committee was appointed, and I happened to be one of the members of that committee; some of my fellow members in the Pharmaceutical Association said that they were very glad that they had not to go among those doctors. We went, and were received with open arms.

The idea of the pharmacists coming to them and asking the physicians of the State Society to take an interest in pharmaceutical subjects was new to them. One of the very grounds for going was to ask them to prescribe officinal preparations to the exclusion of copyrighted and trade-mark preparations, so that the pharmacists might have a chance for their life; that was the sense of the resolution we presented to them. They not only passed that resolution, but also appointed a committee to meet with a similar committee from the Pennsylvania Pharmaceutical Association, to enlarge the scope of the contemplated intercourse. At the last meeting held by the Pennsylvania Medical Society, that Society adopted a By-law appointing a permanent committee to consider matters in relation to pharmacy in connection with medicine, and we think that we have made as fair a start as possibly could be made and under the best auspices.

Now, following out Dr. Cutter's suggestion, a resolution was presented at the meeting of the American Medical Association at Cincinnati, and I am very happy to say that it followed the course which all such propositions must follow according to the organic law of that Association, it was referred to the Council for action, with a favorable consideration. We see that the members of the American Medical Association are warmly in favor of instituting a section on pharmacy. Now, gentlemen, I feel that in this matter we have made very substantial progress, and I want the American Pharmaceutical Association to take action, because the American Medical Association has gone as far as it can in inviting the American Pharmaceutical Association to meet with them, or, at least, in having a section on pharmacy. I think that we should certainly return the compliment, and have a section devoted to medical interests. Probably it would be well not to introduce such a resolution at the present time, but wait until their meeting next year, when we will hear further on the subject.

Mr. Eccles.—The American Medical Association, in the movement it is making now to establish a department of pharmacy, is making, as every one who is progressive at all knows, a movement in the right direction. In making this movement we have taken the initiative in it, and it will not look as if the American Pharmaceutical Association were being dragged as the tail-end, so to speak, of the kite. If this Association establish a department of therapeutics and have it ready, so that we could accept their invitation for a conference, I believe much good will be accomplished. I am a member of both Associations, like Dr. Stewart, and would feel very much gratified if the American Pharmaceutical Association would immediately send an invitation to meet with us. You will find a great deal of difficulty to contend with, both among pharmacists and physicians, in movements like this. Only the progressive men are anxious to bring them into contact. They are the ones who know it will be of advantage to do so. You will find all grades of pharmacists and all grades of physicians; men criticizing the members of the Pharmaceutical Association, and men criticizing the physicians. As you know, some have been excluded on the question of ethics, but that is being settled and the wound is being healed. If we could only get those who are at the top, who are progressive, to come into contact with one another, the troubles constantly arising between pharmacists and doctors, although not immediately healed, still the process would commence there and work down to those who have a different standing in both Associations, and into the ranks of the general practitioners and general pharmacists who are not members. If any satisfactory results are to be had from bringing the two professions together, it cannot be accomplished immediately, but the quicker we get at it the better.

Attention was called to the difficulty of hearing and understanding the speakers. On motion of Mr. Painter, Messrs. Merrell and Ballard were appointed a Committee to select a room better adapted for the wants of the meeting. The Committee subsequently reported that one or more of the parlors in the same building were more suitable, and it was suggested that the sections meet in the parlors. On motion of Mr. De Forest, the report was received with thanks.

Mr. De Forest read the following:

REPORT OF COMMITTEE ON NATIONAL FORMULARY.

To the American Pharmaceutical Association:

The Committee on National Formulary has the honor to report that it has performed the duty entrusted to it, the completed work having been issued from the press about July 1st of the current year. The principal features connected with the preparation and arrangement of the text have been explained with sufficient detail in the preface of the work, and need not be repeated here. There remain, however, several matters which could not be discussed there, but which should receive the attention of the Association, so that a definite plan or policy regarding the management of the work may hereafter be followed. The first question which presents itself is, *How often shall the work be revised?*

It appears to us that this will, to a large extent, depend upon the criticisms of the profession regarding the correctness and general reliability of the text of any particular edition, and upon the number and extent of the changes proposed in its contents. Each separate edition or issue will have to be judged upon its own merits; in fact, while one may require revision within one or two years, another may possibly be allowed to remain unaltered for a number of years. There should, however, be no timidity about issuing a new edition when sufficient material has accumulated, or when important improvements can be introduced. The cost of the work is so low, and the practical benefits that may, it is hoped, be derived from it, are so decided, that no one would hesitate to invest in a new edition, even if an annual revision should be found necessary.

Another important question is, *How shall the work be revised, and by whom?* In our judgment there should be appointed a special Committee on National Formulary, to hold office from one revision to the other, subject, however, to any changes which the Association may deem necessary, the proper time for the discharge of the old and the appointment of a new Committee being at the annual meeting immediately following the issue of a new edition. This Committee should gather together whatever is proposed in the way of improvement by others, and should also carry on original experiments to bring the work to a greater perfection. Since it may become desirable to issue a new edition at a time when it would be embarrassing to be compelled to await the annual meeting of the Association for the purpose of receiving authority to print it, it is recommended that the Council of the Association be invested with full powers in the premises.

While the Formulary was passing through the press, Mr. J. W. Colcord, of Boston, made the suggestion that specimens of the several preparations be exhibited at the present annual meeting. This suggestion met with the full approval of the Committee, and at its request the Council appropriated a sum not exceeding $200, to defray the expenses. The work of preparing the specimens was divided among the members who had signified their willingness to contribute, and the result of their labors may now be inspected in the Exhibition Hall. It will be found that the series is not quite complete. But there are quite a number of preparations in the Formulary of which it was neither necessary nor desirable to prepare specimens (for instance, such as are liable to spoil by keeping, also pills, most mixtures, powders, etc.). Moreover, a number of changes had to be made from time to time, in the assignment of the specimens, and some of the gentlemen who had accepted work, found themselves unable from various causes to fulfil their promises. However, the collection is complete in all essential features, and will serve a useful purpose for our successors, to whom we recommend that it be turned over.

Your Committee has already placed on record, in the preface of the Formulary, the valuable services rendered by a number of gentlemen, not members of the Committee, either individually, or as members or delegates from pharmaceutical bodies. It is earnestly recommended that the Association take such action as will most fittingly acknowledge the obligation in a more formal manner.

Your Committee is convinced that it only expresses the unanimous sense, not alone of the members of this Association, but of all progressive and fair minded pharmacists throughout the land, that there is and shall be only *one* standard, as to quality and strength, to be followed for all officinal preparations, viz, the United States Pharmacopœia; and that, therefore, the National Formulary—which is, at most, intended only as a stepping-stone from and to that authority—is a standard only for those preparations which are *not* provided for by the official work; and further, that from the moment when the United States Pharmacopœia shall provide a formula, a standard for any article or preparation now or hereafter contained in the National Formulary, the authority of the latter regarding this article or preparation ceases and is abolished.

Very respectfully,

CHARLES RICE.

For the Committee on National Formulary.
New York, August 31, 1888.

The following resolutions were offered by Mr. De Forest, and after slight clerical alterations, adopted.

Resolved, First, that a Committee on National Formulary be appointed at the annual meeting following the publication of a revision of the work; the said Committee to hold office, unless otherwise directed by the Association, until their successors are appointed at the annual meeting succeeding the issuing of a revision.

Second, the Council of the American Pharmaceutical Association shall have authority, upon the recommendation of the Committee on National Formulary, to make all necessary arrangements for the publication of a revised edition, and to provide for its distribution and sale.

Mr. Painter moved that a heartfelt vote of thanks be extended to those pharmacists, not members of the Committee, who rendered valuable aid to the Committee.

Mr. Canning moved to amend, that the members of the Committee be included in this vote of thanks.

Mr. Eccles moved to further amend, by specially mentioning Dr. Charles Rice, the chairman of the Committee.

The amendments were severally carried, and the motion as amended was then adopted.

Mr. Painter moved that the President appoint a new Committee of five on National Formulary. Mr. Seabury suggesting that this motion be referred to the Section on Scientific Papers, Mr. Sheppard moved that the whole subject be thus referred. This motion was agreed to.

The Permanent Secretary read the Report of the Publishing Committee (see page 26), and then called attention to the Council resolution of December, 1887, referring to the Association for action the question whether the National Formulary should be published as a part of the Proceedings for 1888. Mr. Good moved that the Formulary be *not* published in the next volume. Mr. Painter moved to amend by striking out the word *not*; the amendment was seconded by Mr. Hallberg, and after a statement by the Secretary that the additional cost would be trifling (about seven cents per volume), was accepted by Mr. Good, and the motion was adopted.

Mr. Sheppard read the Treasurer's report (see page 24), which was accepted and referred.

After receiving invitations from the Michigan State Pharmaceutical Association, and from the Detroit Ammonia Works, Mr. Kennedy read the report of the Committee on Membership (see page 29), which was accepted and referred. Mr. Ebert then referred to the change adopted last year for the admission of members, and expressed the wish that the Committee on Management propose some modification of the present mode. No action was taken.

Mr. Painter read the following:

REPORT OF COMMITTEE ON TIME AND PLACE OF MEETING.

DETROIT, SEPTEMBER 4, 1888.

Your Committee to whom was entrusted the duty of reporting upon the time and place of the next annual meeting, respectfully state that they have received invitations on behalf of the Association from Minneapolis and St. Paul jointly, from Asbury Park, New Orleans and San Francisco.

After a careful consideration of the subject, your Committee have arrived at the unanimous conclusion that the time has come for this Association to decide to hold the next annual meeting on the Pacific coast.

Your Committee were influenced in their decision by the following reasons:

1st. That at no former time in the history of this Association has the financial condition of the body so well warranted taking the important step of a meeting in California as the present.

2d. Our brethren in California have repeatedly invited the Association to meet there, and have represented their need and the benefits that would accrue to pharmacy on the Pacific slope if their Eastern brothers would consent to visit them.

3d. Upon inquiry of a number of members present if they would attend a meeting of the Association in San Francisco next year, assurances have been made which would indicate an attendance which will be thoroughly representative, and will ensure a meeting in 1889 which will stimulate the growth of pharmacy on the Pacific coast to a degree not heretofore expected.

4th. That the railroad fare across the continent has been reduced to such a price that the expense of the trip will deter very few members from going who could afford to attend a meeting in any other locality in the United States.

In view of these facts your Committee unanimously propose that the American Pharmaceutical Association hold its annual meeting in the city of San Francisco in 1889.

Signed,
EMLEN PAINTER,
JOSEPH P. REMINGTON,
P. W. BEDFORD.

In reply to a question, Mr. Painter stated that it was intended that the Council should, at a later date, decide upon the time. Mr. Ingalls then moved that the report of the Committee be adopted; the motion was seconded by Mr. Sander.

MR. HEINITSH.—The question has been discussed for a long time, and I would now call for a vote.

MR. HALLBERG.—I would like to hear first from some one an estimate of the total transportation charges, and also the time required. Of course that is not so material as the first item.

MR. PAINTER.—The railroad fare has been reduced, and will depend upon the number of persons traveling. During the last three years it has been as low as $37.50 to go and return from New York. It was when the cutting was the most severe amongst the railroads. The railroad commissioners, appointed by law of Congress, have made a rule by which, when a reduction of fare is made for any organization, every citizen of the United States can avail himself of such reduction. The railroads are continually making reductions for associations going to the Pacific coast. At the present time we can go to San Francisco and return to Chicago for $72.50, and at a lower rate still from St. Louis. The National Educational Association went to San Francisco this year, and received that rate from Chicago, and even from as far East as New York. I was told by one of the agents of the Rock Island Company that many had gone from New York for that rate. At the present time there is an association meeting in Los Angeles, and the price at which any person could go up to a certain date, the ticket being good for sixty days, was $72.50.

MR. HALLBERG.—That does not include the sleeping cars.

MR. PAINTER.—It does not include the sleeping cars. A berth in the sleeping cars from Chicago is $18.00 either way, and from New York probably $20.00. The meals are $20.00. A double berth, upper or lower, is not more than $21.00. I have been over the road seven times, and I know it does not cost more; these prices have not changed. The time required would not be more than six days; a longer time may be expended, and very probably two weeks would be taken up to make the trip satisfactory.

MR. ECCLES.—There is at present a return excursion from and to New York covering both trips, and the regular fare this side of Chicago is $135, allowing for stop-offs from Chicago at any point, coming or going. I have one of that kind of tickets in my pocket now. It lasts for six months.

MR. REMINGTON.—Allow me to say that Dr. Eccles is en route from New York for San Francisco. He is not going with the party, but is taking a single individual trip.

MR. MERRELL.—I am aware that within the last three months past there has been a round trip to the Pacific coast, including a stoppage on the Pacific coast of over a month, for $125, including everything with the exception of the sleeping car. Now that was made for a large party, and it does certainly seem to me that the time has come for this Association to do part of the work which it is its duty to do, and that is, to encourage pharmacy in all parts of this country. It is in name an American Association, and it should become so in fact, and I think we cannot make it so any better than by going to the Pacific coast and seeing our brethren on that coast, what they look like and what they do, and meet them face to face. I believe that the time has come for this Association to go to San Francisco and to accept the invitation which has been so kindly and liberally and in such a friendly way extended to this body. I earnestly hope, therefore, that the Association will take a liberal view of it, and vote for this motion. I do not believe that the expense to any member will be very much more than it would be to go to New Orleans, Kansas City, or Minneapolis and St. Paul.

MR. SEABURY.—I am sorry to say I will have to go on record on this question as one opposed to going to the Pacific coast. This recommendation has been annually before us for years. We all know it. And I would like the members to understand that I am not speaking for myself, but for a large class of members of this Association who want to meet and love to meet annually within a radius that the typical pharmacist of to-day can afford to visit. Now I know that there are some of us who cannot go to the Pacific coast, and I am sure that no man would go there without losing four, five or six weeks, and it is going to cost three or four hundred dollars, I do not care how economical you may be. I was inquiring as to how many members of this Association will be able to go. If you can get fifty, you will have the largest body that will ever go there; whereas, if you meet in some near-by place almost anybody would like to go, and you will get three or four hundred. The trip to California means no meeting for one year; that is what it practically means, and rather than do that under the new arrangement we have just commenced, I do not think we should take any such radical step at the present time. I think that this Association might meet at Minneapolis and St. Paul, and then let the forty or fifty members of this Association go right on to San Francisco; such a trip might be arranged, and a visit of that kind will satisfy everybody. It strikes me that would be an excellent way out of the dilemma. It is not a question of willingness. We are all willing to go and would be glad to go, but I know that 75 per cent. cannot go; under the commercial conditions under which most of the retail pharmacists are now existing, I do not see how they can go. That is the ground I take, and I hope the Association will vote in such a way that will do the greatest good to the greatest number.

MR. HECHLER.—In regard to the ability to go, I hope Mr. Seabury will speak for himself; as for the balance, I think that the majority of them could go if they wanted to go.

MR. SEABURY.—I am glad to learn that you are in such a flattering condition. It is not so down our way.

MR. PAINTER.—I think that the majority of those who attend our meetings can go if they want to. If you will take the members who attend the meetings, the statistics will show that there are a very large number who could attend the meetings, and yet the number who come as representatives of the different States is small. Take for instance the great State of Massachusetts, and look at the number of those who have attended during the last few years at the meetings of the Association; there were only a few. Take the great State of Illinois, and you will find that at the Providence meeting there were only three or four. Also from the great State of New York, at the meeting held in Cincinnati, which place was certainly central, you had only eleven from the whole State, and I venture to say that there will be more than that from every one of those States, and from every other State, to go to San Francisco. As for the meeting there, it will be, perhaps, second to none in size and numbers, that we have had in this organization.

MR. SEABURY.—How many have come from California?

MR. PAINTER.—I have come from California to represent California at several meetings, and with me two others came from California on two different occasions.

MR. SAYRE.—Viewing this matter in the same way and in the same spirit that Mr. Seabury has done, I ask myself the question as to my own pocket-book, and as to those of my neighbors. Appealing to my own pocket-book, I must say I have to go down very deep in order to go to California, and it is a question in my mind whether I shall be able to go, and I may be deprived next year of the pleasure of meeting you face to face and shaking you by the hand; but at the same time when I view this question in an unselfish and unbiased way, I must feel that it is due to the Pacific Coast that, being an American Association, we shall send our body over there, if possible; and if it only requires the sacrifice of my staying at home for one year, I say that as a member of this Association I am perfectly willing to remain at home, and my prayer will go with you. If you go I shall certainly endeavor to join you. I do think that it is almost the duty of this Association, considering that we have been frequently invited to go, to at least recognize it in some tangible shape, and I do hope that the affirmative vote will be taken in regard to this subject. Now as to the question of the practicability of going, the same question was brought up in the Teachers' Association. A relative of mine is a member of that Association, and when I heard where they proposed to go, I said I did not believe that they would be able to go to California. There seemed to be an opposition; thousands of teachers all over this land, although they have the time, have not the money and they cannot afford it; they only make, many of them, fifty or sixty dollars a month, and that is the rank and file of the Association, and how is it possible for them to go? Nevertheless, in spite of that, the Teachers' Association decided to go to the Pacific Coast, and what is the result of it? They had one of the largest meetings there, and financially, he says, one of the greatest and most successful meetings they have ever had. They adopted a plan which I think is a very good one. They got up a great excursion and put the matter into the hands of a committee. They did not decide at once where they would go; but they advised this committee to wait upon certain officials, to get from them their very best rates to San Francisco in case they would go. They agreed that they would sell tickets from Kansas City for $65, and five dollars of that money they would put into the hands of the Association. What has it done? It has put into the Treasury of the Association somewhere in the neighborhood of $3,000; the five dollars extra which has been given to that Association have put the Association on its feet. If we have some such good executive officers and such financeering plan, we will succeed in this effort, and I hope that we will succeed.

Mr. Hallberg.—Professor Sayre says they had one of the largest meetings in their history, and five dollars out of every ticket was put into the treasury of the Association, which made a sum of $3000, and that represents about 750 attending the trip. Last year they met in Chicago, and there were reported to be in attendance 10,000 members. Now if they can only get a tenth of their usual attendance, what would we have in San Francisco when we have only a tenth of *our* usual attendance?

Mr. Ebert.—At our last Washington meeting, I was the chairman of the committee who were instructed to get the returns of those of the members of this Association who would go to San Francisco the coming year. A report was made, and although I have not the report at hand, and cannot refer to it, I will state from memory. We had 80 members of this Association to return answers that they would go. I will not give you the names of those members, but they were old stand-bys in this Association. They were the persons who went wherever the Association went. They did not go to the meeting at Washington simply to be at the meeting, but they have been usual attendants at the meetings of the Association wherever the Association met, whether it went to Toronto or Milwaukee. There were some 50 who said they would like to go, and the response from the Pacific coast was that 400 said they would meet with us at San Francisco provided that we would come there. It was also promised that there would be twenty-one papers furnished by those residing on the Pacific coast. This question has been coming up year after year, and we have again been invited to go to the Pacific coast; and now I say, gentlemen, as many of the members of this Association will go to the Pacific coast as have come to Detroit. Many who are not at Detroit will go to San Francisco, or to the Pacific coast. This Association owes it to itself as the American Pharmaceutical Association, at this late day, to visit that coast, and to meet the druggists of that vicinity.

MR. BROWN.—We ought not to express our individual preferences. A simple question has been brought up to be decided, Will this Association go to California? Not a selfish idea, but look purely for the benefit of the Association. If each member deems it best to go there, and that it will be to the advantage of the Association, they should express that conviction, and the vote will decide it.

MR. WHELPLEY.—I would like to ask Mr. Ebert what good arguments were brought to bear during the past meetings of the Association upon the question of going to California.

MR. EBERT.—The same arguments are heard against it to-day. It was thought that we would not be able to go there, not on account of the great expense, but that the time would be too long. This question is coming up whenever we go to an extreme point. How many went to Atlanta? How many went to Richmond? How many went to Kansas City, or to Milwaukee? There are no comparisons to be made.

MR. SIMMONS.—One word more before you vote on the subject. I would like to have you understand the whole subject. It seems to me that we have more than one invitation before this Association. Minnesota has two cities, St. Paul and Minneapolis; they have sent invitations to this Association to visit them. There is no better place at which to hold the annual meeting, and when you get there you will find that many of the members will desire to go to San Francisco, those who are willing to pay; and those who are not can stay at home. Let us fix it in that way.

MR. REMINGTON.—About the proposition to go to Minneapolis and St. Paul, and then make up a party to go from there to the Pacific coast, as hinted at by Mr. Simmons, I only want to say that this would be highly uncomplimentary to the pharmacists of the Pacific coast. If we are going to the Pacific coast, let the Association meet there, and not send a small delegation from another city half way there. Let us do the thing right, or not do it. Let us wait rather until we can do it right. I think that if we would go there next year and do it right, it would be good for the Association.

The question was taken on the motion to adopt the report, the chair declared it to be adopted, when a division was called for, and 47 members voted in the affirmative and 7 in the negative.

Mr. Painter moved that the meeting be held on the first Monday in August. Mr. Brown suggested, that the Council fix the time, and Mr. Sheppard moved to amend that a Committee of five be appointed to make all arrangements for the next meeting to be held in San Francisco, and to report to the Council. The motion was seconded by Mr. Seabury, and agreed to.

Mr. Sheppard was called to the chair.

Mr. Alexander read the reports of the Finance Committee, and of the Examining Committee on the Treasurer's accounts (see page 22). They were accepted and referred.

Inquiry was made by Mr. Canning whether a report would be presented at this session from the Committee on the President's Address.

Mr. Alexander.—Mr. Chairman, I had a conversation with two of the members of that Committee, and they said the address was so voluminous, and covered so much ground, that it would be impossible for them to give it the careful consideration which the paper warranted, and that they would take it up during the recess, go over it fully and make their report, and therefore it would not be reported on at this session.

Mr. Ebert called up the amendment to the By-laws offered at the first session, to add to the end of Article V. Chapter VI., the words, "The Secretary may or may not be a member of Council."

Mr. Ebert.—The Secretary of Council is a very important officer of this Association, and he ought to be a more permanent officer than to be changed every year or two, as the present By-laws relating to the Council would make him. Three new members of the Council are annually elected in addition to the officers of the Association, and the Secretary of the Council has always been selected from the members from the Council. Now the duties of that office are of such a character that it will take several years to become familiar with them, and it seems advisable that the Council should be allowed to employ any one outside of their number, if deemed desirable, to hold that office. These were the reasons for the introduction of this amendment.

The amendment was unanimously adopted.

The proposition laid over from the first session, to amend Chapter VI. Article VIII., Section 2 of the By-laws of the Association, was read as follows:

"The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association."

It was explained that the amendment contemplated merely to change the present ambiguous phraseology, without altering the manner of admitting new members. It was adopted without a dissenting vote.

The amendment offered at the first session to add in Chapter VIII. Article IV., after the words "$40" the following: "or after twenty-five years, $30; or after thirty years, $20; or after thirty-five years, $10," was read and unanimously adopted.

The Association then adjourned.

Third and Fourth Sessions.—Tuesday Afternoon and Evening.

Previous to the opening of the first and second sessions of the Section on Commercial Interests, the Association did not transact any business.

Fifth Session.—Wednesday Morning, September 5th.

The meeting was opened by the President, and the Secretary of Council read the names of nineteen candidates for membership, who were elected in accordance with the By-laws. The Association then adjourned, and the Section on Scientific Papers convened.

SIXTH SESSION.—WEDNESDAY AFTERNOON.

No business was transacted by the Association preceding the second session of the Section on Scientific Papers.

SEVENTH SESSION.—THURSDAY MORNING, SEPTEMBER 6TH.

Vice-President Alexander occupied the chair. The Secretary of Council reported five propositions for membership The candidates were duly elected according to the By-laws, and the Association adjourned, when the third session of the Section on Scientific Papers commenced.

EIGHTH SESSION.—THURSDAY AFTERNOON.

The Association did not transact any business, preceding the sessions of the Sections on Pharmaceutical Education and Legislation.

NINTH SESSION.—FRIDAY MORNING, SEPTEMBER 7TH.

President Lloyd called the meeting to order. The Secretary read the minutes of the preceding sessions, which were approved. The Secretary of Council read the minutes of that body, which, on motion, were approved.

FIFTH SESSION OF COUNCIL, SEPTEMBER 5. (8 members present.)

Nineteen propositions for membership were examined and referred to the Association for action.

The amendment to the By-laws of Council, laid over from the fourth session, was considered, and unanimously adopted. The By-law as amended reads: Chap. VIII., Art. I. The Council shall meet previous to the assembling of the Association, and at such other times as they may adjourn to, or at the call of the Chairman.

SIXTH SESSION OF COUNCIL, SEPTEMBER 6. (5 members present.)

Five propositions for membership were examined and ordered to take the usual course.

SEVENTH SESSION OF COUNCIL, SEPTEMBER 6. (8 members present.)

Eight propositions for membership were examined and commended to the Association.

First Session of the New Council. (13 members present.)

The organization was effected by the election of J. M. Good, Chairman; Emlen Painter, Vice-Chairman, and G. W. Kennedy, Secretary.

The committees were constituted as follows:

Committee on Membership.—A. H. Hollister, *Chairman*, M. W. Alexander, C. L. Keppler, P. C. Candidus, A. A. Yeager, and the Permanent Secretary and Treasurer *ex officio.* G. W. Kennedy was elected secretary of the committee.

Committee on Publication.—C. L. Diehl, *Chairman*, L. C. Hopp, F. Wilcox, H. Canning and J. M. Maisch.

Finance Committee.—Wm. Dupont, *Chairman*, Jas. Vernor and F. Wilcox.

Committee on Centennial Fund.—M. W. Alexander, *Chairman*, W. Dupont and J. M. Maisch.

On motion of Mr. Sheppard, the Secretary of the Committee on Membership was instructed to send to the members of the Association, a short time previous to the next annual meeting, a circular showing clearly the method of admitting new members, together with a blank proposition to be filled out by the members and returned to the Committee on Membership.

The Council adjourned to meet again on the morning of the day of the annual meeting next year.

The propositions for membership reported by the Council, were favorably acted on, and the candidates elected.

The President appointed Messrs. Hoffmann and Remington, a Committee to conduct the officers elect to their stations. Mr. Alexander was introduced as the President elect.

Mr. Alexander.—Gentlemen of the Association: I have been before you for the last three years, and have received so many honors at your hands that I really think the only thing I can do is to express my thanks for this great and crowning honor which you have bestowed upon me. I will endeavor to do my duty, and rule fairly and firmly, according to the Constitution and By-laws of the Association, and I ask you for your indulgence and assistance in advance; your indulgence for any mistakes that I may make, and I am sure to make them, and your assistance in setting me right when I have made them. (Applause.)

Mr. Vernor, the first Vice-President elect, not being present, Messrs. Wilcox and Yeager were introduced as the second and third Vice-Presidents, and expressed their thanks for the honor conferred upon them by the election to these positions.

The report of the Committee on the President's address was read, as follows:

To the President and Members of the American Pharmaceutical Association.

The Committee to whom was referred the President's address, would respectfully report that they have carefully reviewed the same, and find it is impossible to give complete report in the limited time at their disposal.

There are however two subjects that should have prompt attention in our judgment; viz., Section 22, which refers to a new line of preparations; this in our opinion should be referred to the Committee upon the Revision of the Pharmacopœia. Also Section 25, which recommends that the Secretaries of the Sections should receive sufficient compensation to enable them to meet the necessary expenses of attending the meeting. Upon the remainder of the suggestions offered in this valuable address, your Committee would ask the privilege of reporting at a later date to the Council for publication.

Respectfully submitted,
JOHN WEYER,
GEO. W. SLOAN,
JOS. L. LEMBERGER.

On motion of Mr. Good, the first recommendation, referring to a new class of preparations, was adopted, and the subject was referred to the Committee on the Revision of the Pharmacopœia.

The second recommendation, relating to compensation for the secretaries of the Sections, was, on motion of Mr. Sheppard, referred to the Council.

On motion of Mr. Painter, the request of the Committee was granted, to report to the Council, for publication, upon the remaining suggestions of the President's address.

Mr. Sheppard moved that the Local Secretary, when appointed, be chairman of the Committee on Arrangements, and that he appoint his assistants. After some discussion, the motion was agreed to.

Mr. Finlay, who had voted in favor of holding the next meeting in San Francisco, moved for a reconsideration of that vote. The motion was seconded, and on taking the question, 30 members voted in favor of, and 34 members against reconsideration. The motion to reconsider was declared lost.

Mr. BEDFORD presented the following:

Resolved, That the Permanent Secretary be empowered to arrange the schedule, naming the dates and hours at which the sessions of the Sections shall be held at the next annual meeting; and that he be instructed to have the same printed in a prominent place in the Proceedings, and if this is not feasible, to have the same printed in a circular and sent to different members before the next meeting.

Mr. Painter nominated Prof. Edward W. Runyon, of San Francisco, to be Local Secretary for the next meeting. On motion of Mr. Remington, the Secretary was directed to deposit an affirmative ballot for the nominee, which being done, Mr. Runyon was declared to be elected Local Secretary.

The President appointed the following Committees:

Committee on National Formulary: C. L. Diehl, Louisville, chairman; C. S. Hallberg, Chicago; G. H. C. Klie, St. Louis; C. T. P. Fennel, Cincinnati; and Adam Conrath, Milwaukee.

Committee on the Revision of the Pharmacopœia: L. C. Hopp, to fill the vacancy occasioned by the removal of A. B. Lyons.

Committee on Railroad Arrangements: Emlen Painter, New York, chairman; Karl Simmon, St. Paul; T. N. Jamieson, Chicago; Robert J. Brown, Leavenworth; and Enno Sander, St. Louis.

Committee to Visit the American Medical Association: Jos. P. Remington, Philadelphia, chairman; Chas. A. Heinitsh, Lancaster, Pa.; Karl Simmon, St. Paul. (Two more members to be appointed.)

From the Section on Commercial Interests, the following report was presented:

DETROIT, MICH., *September* 7, 1888.

To the Officers and Members of the American Pharmaceutical Association:

GENTLEMEN—Your Committee on Exhibits beg to report that the exhibition in connection with the 36th meeting of this Association is beyond all question superior to any previous attempts in this direction.

We believe this is largely due to the ample and complete accommodations provided by the Committee of Arrangements, also to the offer of the two medals as prizes, which undoubtedly stimulated many exhibitors to put forth their best efforts.

In awarding the prizes your Committee has found it difficult to select the best from so many creditable displays, but after a very careful examination of them all it is our decision that the gold medal "for the best general exhibit" be awarded to *Messrs Hance Bros. & White, of Philadelphia;* and for "the best exhibit made by a retail pharmacist of pharmaceuticals made in his own shop," we award the gold medal to *Messrs. Feldkamp & Hallberg, of Chicago, Ills.*

Below we append a brief description of each exhibit. All of which is respectfully submitted.

FREDERIC WILCOX,
JNO. F. PATTON,
ALEXANDER K. FINLAY.
Committee.

Acme White Lead & Color Works, Detroit, Mich.—A variety of paints in liquid and paste form, varnishes, gums, stains, etc., and quite a number of specialties in their line.

Anderson Manufacturing Co., Detroit.—Double pressure percolator and repercolating apparatus.

Banner Cigar Manufacturing Co., Detroit.—A line of "fine cut" tobacco, the leading brands being their "Banner" and their "$40" cigar, for sale to druggists only.

P. W. Bedford, New York.—Exhibits two very interesting habitat maps, one of South America and one of Asia. These maps are at once interesting and instructive, and are certainly a valuable acquisition to the exhibition feature of this convention.

Benton, Myers & Co., Cleveland, Ohio.—Display a line of Duroy wines of native manufacture and for medicinal use.

Berry Bros., Detroit, Mich.—Varnishes and hard oil finish. They show the crude material from which these things are made, some beautiful samples of bleached shellac, the manufacture of which is a new industry in the west. They also show a line of their durable "stains."

Boydell Bros., Detroit.—Paints, colors, varnishes, white lead, mixed paints, etc.

William P. Burk & Co., Philadelphia.—An interesting display of fine sponges and chamois skins.

C. S. Burroughs, Clinton, Mich.—"Scarletto," claimed to be the only dye on the market that gives a fast scarlet of any shade on cotton.

J. P. Bush Manufacturing Company, Chicago.—"Bovinine."

Chesebrough Manufacturing Company, New York.—Vaseline and its various combinations for medicinal use, also in form for lubricant and for toilet purposes.

The Cibils Company of the U. S., New York and Boston.—Cibils beef.

Clifford & Catrevas, Boston.—Have a very large exhibit of sponges, chamois skins, and some curiosities in the way of shells, etc.

Coffin & Wood Chemical Co., Detroit.—Essential oils, menthol, etc.

J. W. Colcord, Boston.—A line of preparations made in retail drug store, consisting of fluid extracts, elixirs, ointments, sachet powders, perfumes, etc.

Columbus Buggy Company, Columbus, Ohio.—A very handsome assortment of vehicles for the use of physicians.

H. D. Cushman, Three Rivers, Mich.—Cushman's Inhaler, also menthol in bulk.

Dean, Foster & Dawley, Boston and Chicago.—An interesting assortment of druggists' glassware and druggists' sundries, and general line of bottlers' goods.

Detroit Cigar Manufacturing Co., Detroit.—Exhibit their leading specialty, "Green Seal" cigar, with handsome samples of the leaf tobacco used in their goods.

Detroit Motor Co., Detroit.—Exhibit a small motor for application to sewing machines, small manufacturing, for dentists' use and for ventilating apparatus.

Detroit Safe Co., Detroit.—Fire and burglar proof safes with time lock attachments.

Detroit Tobacco Co., Detroit.—Cigars, fine cut and plug tobacco and smoking tobacco.

Detroit White Lead Works, Detroit.—A line of paints, colors and varnishes for house and carriage use, together with numerous specialties in this particular line.

The Devonian Mineral Springs, Lorain, Ohio.—Mineral springs water.

Doliber, Goodale & Co., Boston.—Having but one article to exhibit, "Mellin's Food," it is surprising what a tasteful and unique display they make.

Duroy Wine Co. and Bay View Vineyards, Lakeside, Ohio.—A line of fine medicinal native wines.

Eastman & Bro., Philadelphia.—Have without doubt the most chaste and elegant assortment of perfumes, toilet soaps and plush odor cases. Their great specialties are Aloha, Manona and Blue Bells of Scotland.

Egan Imperial Truss Company, Ann Arbor, Mich.—Manufacture a peculiar sectional "truss," for which is claimed economy, lightness and ready adjustment and replacement of parts.

W. H. Ellis, Detroit, Mich.—A line of Juan F. Portuondo's Cuba hand-made cigars.

Fairchild Bros. & Foster, New York.—An instructive exhibit showing the use of the digestive ferments in preparing different peptonized foods for the sick. The exhibit consists principally of digestive ferments both peptic and pancreatic. Besides the goods as they are to be found on the market, they have a complete apparatus with which to demonstrate the action of these goods.

Farrand, Williams & Co., Detroit.—Fluid extracts, elixirs, medicated wines, and syrups. Their fluid extracts are made by a novel process of their own. They also exhibit a line of paints and colors.

Fechheimer Bros., Detroit.—Agents for the Inglenook Vineyard of Napa county, California. They claim absolute purity for their goods, and the "Pure Wine" stamp of the State is affixed to each bottle.

Feldkamp & Hallberg, Chicago.—Have an interesting and instructive display of home-made chemicals and pharmaceuticals, also a peculiarly constructed extractive apparatus.

Florida Wine Company, Philadelphia, Pa.—Orange wine.

Foote & Jenks, Jackson, Mich.—A line of fine odors, thirty in number, their leading specialty being their "Linden Bloom," an odor delightfully fragrant and said to be lasting.

Gillam's Sons, Philadelphia.—Cork tops, plain and embossed envelopes, and druggists' general labels.

Hance Bros. & White, Philadelphia.—Exhibit a full and complete line of pharmaceutical preparations, such as fluid, solid and powdered extracts, sugar-coated and compressed pills, elixirs, plasters, absorbent and medicated cotton, fruit juices, compressed tablets and lozenges, and Hance's drug mill. This display, beautiful in design and costly in construction, is both attractive in appearance and instructive in its character.

T. W. Heineman, Chicago.—A full line of surgical and medicinal plasters, antiseptic dressings, chest protectors and suspensories.

Hopkins & Robinson, Louisville, Ky.—Cash register.

Irondequoit Wine Company, Rochester, N. Y.—Have an exhibit of native wines and brandies, which they claim are made from the pure juice of choice selected ripe grapes, and are absolutely pure and matured by age.

Johnson, Glover & Co., Detroit.—Pills, fluid extracts and elixirs, and a general line of non secret preparations.

Thomas Leeming & Co., New York.—"Nestle's Milk Food" and "Nestle's Condensed Milk." These are staples known to all.

Charles Lippincott & Co., Philadelphia.—They show several fountains of elegant finish and design, also the various attachments and syrup containers and much that is of interest in this connection.

Lutz & Movius, New York.—Antipyrine, lanoline and lanoline preparations, saccharine, urethan, resorcin, etc., etc.

McKesson & Robbins, New York.—A line of fine and rare chemicals, pharmaceutical preparations, etc., an exhibit of carefully selected New Remedies arranged in sealed watch glasses set in velvet lined frames with permanent labels, giving their names, classifications and bibliography, also a number of original packages seldom seen by druggists, one of black bee honey being especially interesting. They also have a line of gelatin coated pills and granules, fluid extracts, tinctures, and syrups made from fluid extracts, also fruit juices, etc., etc.

A. Major, New York.—Major's cement.

John M. Maris & Co., Philadelphia, New York and Chicago.—A beautiful assortment of druggists' glassware and druggists' sundries.

Wm. S. Merrell Chemical Co., Cincinnati, Ohio.—Show a full line of their specialties, including fluid extracts, elixirs, alkaloids, syrups, pills and active principles.

The Merz Capsule Co., Detroit.—Filled and empty capsules and samples of gelatin from which they are made.

Michigan Ammonia Works, Detroit.—Gas water, ammoniacal liquor, ammonic hydrate.

Milburn & Williamson, Detroit.—Show a full and very complete line of pharmaceutical preparations, also an assortment of non-patented remedies, perfumes, and toilet goods, surgical instruments and appliances.

Mulford & Sommers, Philadelphia.—Automatic tablet machine, also fruit juices for the instantaneous preparation of syrups.

Parke, Davis & Co., Detroit.—This house has brought together a very large, elegant, and comprehensive display of great scientific interest. It includes an extensive variety of their manufactured products, the various steps in the production which are in some instances illustrated by explanatory samples.

The materia medica section embraces their complete collection of South American cinchona barks, a set of the officinal drugs of the German Pharmacopœia, together with an elegant display of botanical specimens from their herbarium. A number of new drugs now under investigation are also to be seen.

The digestive ferment exhibit is of particular interest, not alone from the fact that a large quantity of pepsinum purum in lamellis, with its various compounds, is shown, but also a unique apparatus for determining the digestive strength of this ferment.

This valuable, instructive and symmetrical display is for inspection only, its owners in courtesy to visiting exhibitors refraining from competing for prizes.

Dr. H. C. Peckham, Freeport, Mich.—Exhibit Peckham's cough remedy.

Pharmaceutical Era, Detroit, Mich.

Pharmacy Hall, Boston, Mass.—Exhibits the Sparrow mixer, the Star ice shaver, the lightning milk shake, the dial register balance, Doctories segars, Leeds hot soda apparatus, Gessner's colored fires, Wells' vaccine virus, Beech & Clarridge's fruit juices, Frui Miz, and Colcord's milk container.

Pictorial Printing Co., Chicago.—Show a line of pill and powder boxes, labels, etc., also Antram's label cabinet.

Powers & Weightman, Philadelphia.—Have an elegant but unostentatious exhibit of fine and rare chemicals used in medicine and in the arts.

Proctor & Gamble, Cincinnati, O.—Exhibit some beautiful samples of their vegetable glycerin, for which they claim absolute purity, and guarantee to be of vegetable origin, also some crude glycerin from tallow, and some from cotton-seed oil, illustrating the marked difference between the two.

Randolph Paper Box Co., Richmond, Va.—Paper boxes of every description.

Richardson Drug Co., St. Louis, Mo.—A general assortment of selected drugs and fine oils.

Rochester Drug Co., Rochester, N. Y.—Pills, plasters and felt tooth polisher.

Royal Chemical Co., New York.—Royal pepsin.

Seabury & Johnson, New York City.—Pharmaceutical and surgical plasters, dressings and absorbents. They show not only the finished goods in handsome variety, but samples of crude materials and specimens of their products in the several stages of manufacture.

Seely Manufacturing Company, Detroit.—Exhibit a line of their fine odors, both bulk and bottle goods. together with a large lot of the crude material from which perfumes are made, all valuable and interesting in their character. There are also to be seen sachet powders and toilet requisites.

Specimens of National Formulary Preparations.—Made by the National Formulary Committee. This exhibit is intensely interesting in its character, and represents the labor of several members of the Committee.

The Springer Torsion Balance Company, New York.—Make a fine display of druggists' prescription and counter balances. The merit claimed for this scale is its wonderful capacity, extreme sensitiveness and total absence of friction.

Frederick Stearns & Co., Detroit.—Show a line of fluid extracts, elixirs, sugar and gelatin coated pills, soluble extracts, perfumes and toilet waters, and also a complete line of non-secret preparations, and a line of pure powdered drugs.

A. M. Todd, Nottawa, Mich.—Essential oils, crude and refined, with plants from which they are produced, also a complete model of his essential oil distillery, which is the largest in the world. The resinoids and the crystalloids from the oils are shown, also several specimens of spurious oils bought in the open market. A collection of rare and ancient works on chemistry from the time of the alchemists.

Trommer Extract Malt Company, Fremont, Ohio.—Trommer's malt and Trommer's diastastic food.

James Tufts, Boston, Mass.—Soda water apparatus.

The Upjohn Pill and Granule Company, Kalamazoo, Mich.—Show a line of pills and granules made by their peculiar process without excipient, yielding products permanently friable and in most desirable condition as to solubility, and these methods are said to be such that absolute accuracy in subdivision is attainable.

Wm. R. Warner & Co., Philadelphia.—Granulated effervescent salts of bromo soda and bromo potash. Large sample of caffein.

Wood Alcohol Company, Detroit.—Three grades wood alcohol, 92 per cent., 95 per cent., and 97 per cent., also acetone purified for the manufacture of chloroform and celluloid, and solvent for copal.

Charles Wright & Co., Detroit.—Have a display of pharmaceutical preparations, toilet articles, and a line of non-secrets.

John Wyeth & Bro., Philadelphia.—A full line of tablet triturates, fluid extracts, elixirs, compressed lozenges, hypodermic tablets and Wyeth's malt, and an assortment of concentrated flavoring extracts.

On motion of Mr. Canning, the report was accepted and referred for publication, and the recommendations contained therein were adopted.

On motion of Mr. Keppler, a vote of thanks was tendered to the retiring President and officers for their untiring efforts during the past year.

On motion of Mr. Ebert, the hearty thanks of the Association were voted to the Local Secretary and his associates for the hospitality shown to the visiting members.

Mr. Bedford moved a vote of thanks to the press, and Mr. Canning a vote of thanks to the citizens of Detroit for their courtesy and hospitality. The motions were unanimously adopted.

An adjournment was now moved by Mr. Ebert, and adopted, to meet again next year in San Francisco, at a time to be designated by the Committee on Arrangements.

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

FIRST SESSION.—TUESDAY AFTERNOON, SEPTEMBER 4.

Mr. Hollister, chairman of the Section, called the Section to order, and stated that his address would be read at the evening session, when the members of the Michigan State Pharmaceutical Association would also be present and several papers would be read.

Secretary J. W. Colcord stated that the minutes of last year's sessions of this Section had been published in the Proceedings for 1887, and the reading of these minutes was on motion dispensed with.

The resolution laid over from last year in relation to the proper labeling by manufacturers of their products was read and discussed. Mr. Rogers suggested that the Secretary of the Section communicate with the manufacturers on this subject and request them to reply. Mr. Finlay recommended to confer with the Wholesale Druggists' Association on this matter. Mr. Rogers then formulated the following, which, on motion of Mr. Heinitsh, was adopted:

Resolved, That the Secretary of the Section on Commercial Interests be directed to correspond with manufacturers, requesting them to label their products in conformity with the officinal nomenclature, and to designate strength by specific gravity or percentage strength, abolishing arbitrary signs and obsolete standards, such as F marks and Beaumé, and that the co-operation of the National Wholesale Druggists' Association towards securing said results be solicited.

The Secretary read his annual report, as follows:

As brevity is said to be the soul of wit, for lack of wit I will make this my first report brief. I have answered all calls made upon the office to the best of my ability. During the fall and winter considerable work was done, entailing a goodly amount of correspondence with the officials of State Associations, members of Congress, and others, looking to a repeal or reduction of the special tax, as instructed by the vote of the Association at the last meeting; but it soon became apparent that nothing could be gained until after the coming Presidential election. I think our work will bear fruit another season. There is good reason to expect a reduction of the tax on alcohol and a reduction of the special tax as retail liquor dealers to a minimum fee, say $1.00. I have attempted to secure writers who should present their views upon timely subjects of trade interests, but with ill success. It was the old familiar story, "Suffer me first to go and bury my father," or some kindred excuse.

I must plead in excuse for a lack of a greater amount of work in this direction, an unusual amount of personal business that could not in justice to myself be overlooked. The fact that the new By-laws were not well digested by our members, nor in fact by our officers themselves, has worked to our disadvantage the past year. The duties pertaining to the different Sections have not as yet been sufficiently defined; a desire not to encroach upon the domain of another Section being noticed, that prevented either Section undertaking it in one or two cases.

During the coming year, I think a circular letter should be mailed to each of the State Associations, requesting them at their annual meetings to have their committees on trade interests, or kindred committees, prepare and send to this Association any suggestion for trade improvement or other matter voicing the Association, and when the roll is called of the several states, that each shall have some delegate ready to report it, and prepared to open the discussion that may follow. Any pharmacist can thus present a matter that may seem to him important before his State Association, and if deemed of sufficient importance, it can then be brought before this Association with a better endorsement, with better preparation, and at a saving of valuable time to us.

J. W. Colcord.

On motion of Mr. Finlay, the report was accepted, and the suggestions contained therein adopted.

On motion of Mr. Good, a committee of three, consisting of Messrs. Alexander, Ebert and Finlay, was appointed, to nominate a Chairman and Secretary of the Section. A Committee on Exhibits was also appointed, consisting of Messrs. F. Wilcox of Connecticut, J. F. Patton of Pennsylvania, and A. K. Finlay of Louisiana.

The Nominating Committee presented the following report, Mr. Rogers occupying the chair:

The Committee on Nominations respectfully report the names of the present officers for re-election:

A. H. Hollister, President.
Jos. W. Colcord, Secretary.

Signed,
M. W. Alexander,
Albert E. Ebert,
John Ingalls.
Committee.

Mr. Hollister wished to decline a re-election; but the Nominating Committee explained that in order to get the Section in good working condition it was desirable that the present officers retain their places for at least another year. On motion of Mr. Heinitsh, the Committee's report was accepted, and the Secretary instructed to cast a ballot in favor of the nominees. The officers were then declared elected.

On motion of Mr. Hallberg, the chairman of the Section was requested to appoint three assistants to serve as the remaining members of the Committee on Commercial Interests.

Mr. Hollister occupied the chair, and Mr. Canning presented the following:

Resolved, That this Association request the manufacturers of the rebate system to furnish no rebate goods to any firm or party retailing such goods, in however large quantities they may desire to purchase, and that we ask the co-operation of the National Wholesale Druggists' Association in carrying out this action.

After some discussion by Messrs. Hallberg, Colcord, Eccles, and Painter, a motion was made by Mr. Colcord, seconded by Mr. Alexander, and adopted, that the resolution be referred to a committee of three. The chair appointed Messrs. Canning, Hallberg and Eccles said committee.

At the request of the chair, Mr. Alexander introduced Mr. C. F. G. Meyer, of St. Louis, as the representative of the National Wholesale Druggists' Association.

MR. MEYER.—Mr. chairman and gentlemen: I came here as a pharmacist, rather than as a representative of the National Wholesale Druggists' Association. But being a member of that Association, as well as a member of this, and as Mr. Hinchman, a very prominent citizen of Detroit, who was appointed chairman of the delegation from the National Wholesale Druggists' Association* to represent them here, was not able to put in his appearance, Mr. Alexander suggested that I fill the place, however humbly it may be done. I therefore take the occasion to greet you, gentlemen, in the name of that Association, and I beg to state that the Wholesale Druggists feel a deep interest in the welfare of this Association, not only in a commercial sense, but also in regard to its scientific pursuits. I believe I voice the sense of the National Wholesale Druggists' Association in stating that the A. P. A. is a great achievement and the pride of this country, and that we take a deep interest in its well being. We certainly are so intimately related with one another that it would be difficult for one Association to exist if the other did not, and I wish to close these remarks with repeating the greetings from the kindred Association.

Mr. Seabury spoke of the alleged substitution, by pharmacists and others, of the products of one manufacturer for those of another. Messrs. Eccles, Brown and Eliel made remarks on kindred subjects, when Mr. Hallberg raised a point of order as to the irrelevancy of the discussion, and Mr. Painter inquired for the question before the meeting. The chair decided the discussion out of order, there being no motion before the house, and the Section then adjourned until 8 o'clock p. m.

SECOND SESSION—TUESDAY EVENING, SEPT. 4.

Chairman Hollister called the Section to order, and stated that this session was a joint meeting of the American and the Michigan State Pharmaceutical Associations, and he introduced the President of the latter Association, Mr. A. Bassett.

MR. BASSETT. Mr. President and ladies and gentlemen, I came here this evening to be looked at, and not to talk. However, I will simply say that this meeting, on the part of the State Pharmaceutical Association, is held at the invitation of the American

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* Messrs. T. H. Hinchman, W. C. Williams and J. E. Davis, of Detroit, and G. J. Seabury, of New York, were the delegates from the N. W. D. A.—EDITOR.

Pharmaceutical Association. We come here this evening prepared with a paper to present to you on the subject of commercial interests. I think also that some of our members are ready to discuss that paper, or speak on some subject that will be of interest to you. I have nothing to present to you now.

Mr. Hollister then read the annual address of the Chairman of the Section on Commercial Interests, as follows:

GENTLEMEN: There is, perhaps, no profession of the present day which requires, in order to its successful pursuit, a greater combination of qualities in those who undertake it, than that of pharmacy. Without a properly qualified pharmacist to compound, with skill and accuracy, his prescriptions, the physician is liable to have his best efforts baffled at every point. The health, and even the life of the public depends on the pharmacist's fitness to perform accurately the duties of his profession. His is indeed a public trust, in which the element of confidence in his character and ability takes a prominent place. To him is delegated the care of all the potent agents that are used by the physician to alleviate human suffering. Disease is the common lot of mankind, and every man, woman and child must, sooner or later, require the services of the pharmacist, for the preparation of the medicines directed to be used by the physician.

The various colleges of pharmacy throughout the United States attest the seriousness of the view, in this respect, of those who advocate the thorough training and liberal education of all who are to practice our calling. The skilled pharmacists of this country are eager to employ every proper means to advance the cause of education. This is well proved by the increasing number of States which have enacted pharmacy laws, and of local associations having for their object the spread of scientific knowledge, and the limitation of the practice of pharmacy to those who have been trained to its pursuit.

However, while these things are so, it still remains a fact, up and down the breadth of the land, that patience and perseverance are necessary qualities, without which the average druggist cannot hope to attain success. It is certainly right and proper that we should have an exalted idea of our profession, related, as it is, at once to science on the one hand, and to the public welfare on the other; but it must not be forgotten that there is no royal road to that position of eminence which most of us more or less covet. It has been said, that "He who ascends the ladder must begin at the lowest round; all those who are above were once below:" of whom can this be more truly said than of the average druggist of to-day? Patience, perseverance, painstaking and plodding are the rounds in the ladder, by which the most successful in our line have neared the top.

We are here to-day, gentlemen, to discuss ways and means, to compare notes, to relate our experiences, and to adopt measures which we may carry away with us, and put into practice in our several communities. A gathering such as this is intimately connected with our business welfare. In addition to their tendency to foster an esprit de corps—a most valuable and stimulating thing—these special occasions, on which active minds, attracted from all parts of our broad land, with their thoughts, experience, and friction one with another, should generate a renewed interest and enthusiasm in every breast. Thus, on his return home, the druggist will find a fresh impetus imparted to his ordinarily humdrum life. One only regrets that there are not more of the rank and file of our great army gathered together, at these periods of city, state and national meetings, to devise methods by which better to secure business efficiency and success.

To take concerted action, with a view to securing more largely and certainly the bread and butter of life, may, at the first glance, seem a somewhat sordid proceeding, but for all of us it is an absolutely necessary one. It is, indeed, too true that a great many of our number are content with a very thin slice of bread, and a corresponding quantity of butter, and that of a poor quality, but this pitiable fact should not deter those who are present from seeking, by every legitimate means, to increase the quantity and improve the quality of both.

The druggist has been accused, not always unjustly, of too frequently confining himself to the rut of his daily routine of duties. The fact is that often he has worn the rut so deep that he is unable to see above the daily grind of ancient ways and methods walked in by his forefathers. He is apt, in consequence, to press his nose more closely to the grindstone, and it would require something like a financial earthquake, or the meeting of a rousing druggists' association in his own locality, to awaken him to a sense of his duty and opportunities. Thus he might be led to climb the genial, life giving heights to the American Pharmaceutical Association, or bask awhile in the sunshine and energizing influence of that of Michigan, and thereby be induced to give heed to the invitation to enter other pastures fairer and greener than those of which he has hitherto even dreamed—

"An ampler ether; a diviner air."

Without dwelling longer here, I would call your attention for discussion at this time to some practical matters, with a view to the more successful climbing of the business ladder. I ask for them your careful attention and serious thought, in the hope that by our united wisdom we may be able, in fields pharmaceutical, to make two blades of grass grow where at present only one finds sustenance.

In our life work, amid the engrossing calls of daily toil, we must by precept, example, practice, and all the influences within our reach, uphold the idea that the demand of the day is for more careful training in our profession, and a higher standard of excellence. A more exact knowledge of all its branches should be sedulously sought after. We imperatively require the public confidence, and we may be assured that at any rate the intelligent classes will adopt that view of our status which we ourselves create.

. As every one present is aware, there has been, during the last quarter of a century, a wonderful advance all along the line of pharmacy, and that notwithstanding the great strides the various arts and sciences have made in the same period, it may claim to have held its own in progress and development. Therefore, as a matter of absolute necessity, if we would not fall behind in the race and keep steadily in the front, we must employ all the means in equipping ourselves, which the educational advantages of the day afford.

At the same time we must not forget that commerce gives to the great majority of us our bread and butter, and that only those in our profession who have reached the topmost rounds of the ladder can hope to exist on professional fees. Commercial interests are therefore, to the larger portion of our members, matters of vital importance, and the Commercial Section of the American Pharmaceutical Association should strenuously seek to conserve and develop these.

The first point I notice is one that bears a very important relation to the pharmacy of the future, and it is one that will commend itself to every considerate mind. In justice to ourselves and the best interests of our profession, it should be held imperative that no one should be received as an apprentice who is not of unimpeachable moral character, and who has not at least a thorough common school education. The intelligent youth possessed of this foundation on which to build the superstructure of a good druggist, makes a hopeful beginning, and, if he has had afforded him, as he ought to have, opportunity and assistance to improve daily, he is reasonably likely to become an ornament to his profession. His ambition in this direction should be fostered by every kindly means, and the necessity for steady application urged upon him gently but persistently. He should have instilled into his imagination a lofty idea of his calling, and be led to entertain an ambition to rise to its height.

"Fame is the spur that the clear spirit doth raise
To shun delights, and live laborious days."

Secondly.—Another matter of great importance is the relation between the doctor and the druggist. That it should be clearly defined, in a straightforward, business-like way, goes without saying. The relation is exceedingly close and delicate, and the interests of both run in nearly parallel lines. It has already been stated how helpless a physician is unless aided by a capable pharmacist, and it may be said that nothing could be more unfortunate than a misunderstanding between them. There should be no room left for the possibility of working at variance, or for the idea arising that their interests are conflicting. The plain and simple way of preventing any such deplorable condition of affairs is to have a definite and unmistakable arrangement founded on recognized professional methods.

Third.—A question which calls for concerted action on our part is that of insurance. It is generally conceded that we are taxed without measure, and that our risks are classed as hazardous and extra hazardous without warrant in fact or reason. The explanation of this anomalous state of things is to be found in the readiness with which we have submitted to undue burdens without vigorous protest. Now, indeed, measures of relief are beginning to be sought, as is indicated by the establishment of a Wholesale Druggists' Insurance Company, and by the instructions given by the Wisconsin Pharmaceutical Association, at its meeting last month, to a committee to proceed to secure the necessary legislation, this winter, for the organization of a "Wisconsin Druggists' Mutual Insurance Company." There are many mutual insurance companies among farmers in our State, which have, for years, insured their property for one-half the rates charged by the old line companies: why cannot the druggists do likewise?

Fourth.—The tariff on medicines is a question which, no doubt, interests many of you, and calls for your careful consideration, and, in so far as it affects our interests adversely, we should seek to remedy it. The $25.00 U. S. Revenue Tax comes properly under this head, calling loudly for removal, and I trust it is in a fair way to be wiped out.

Another point of interest to the pharmacist, and one which has an economic bearing, is that relating to the cultivation of medicinal plants. With all the known conditions of climate within our borders, why may we not use our influence with the general government to induce it to apply a part of the great treasury surplus for experimental purposes in propagating medicinal plants? We should thus, as a people, be rendered more and more independent of foreign supplies. For instance, it is said that the poppy, once sown in the South, is self-propagating; why not inaugurate poppy cultivation, and thus supply our home market with the great pain-reliever? Then the reports from the opium districts of Asia Minor would lose their interest, and we would save to the country large sums annually.

In a recent report the United States Minister at Teheran speaks of opium as now occupying the first place in the foreign trade of Persia, the exports being principally to Hong Kong and London. The reporter expresses the opinion that in California and other parts of the United States there are regions adapted, both climatically and from the nature of the soil, for the successful cultivation of the opium-yielding poppy. It may be remarked that the correctness of this view has already been demonstrated in Minnesota by Mr. Wescheke (a pupil in the Wisconsin University School of Pharmacy), who is, however, of the opinion that the cost of labor and the constant attention required by the plant would be a bar to its profitable cultivation in the United States.

According to the Oil, Paint and Drug Reporter, the cultivation of the indigo plant is now beginning to attract the attention of the farmers in some sections of the United States.

The Citrus family do well in this country, and Powers & Weightman are now successfully making citric acid, oil of orange, oil of lemon, rose water, orange flower water, oil of rose, and numerous articles.

Note also the valuable report of the California State Board of Horticulture, referring to the olive culture, which has become one of the industries of that State of wonders in climate, as illustrative of the possibilities of our country, that in the near future we may hope to obtain our entire supply of olive oil of superior quality within our own borders. If this matter were duly attended to, and enterprising individuals of the right stamp were sufficiently interested in it, it is probable that the circumstances and climatic conditions of the country might conduce to bring to our home markets a greater number of new and old productions, vegetable and mineral, than falls to the lot of any other land.

Fifth. A vexatious matter, on which this Section should pass its judgment, is the "cutting craze." In the meantime I merely allude to it as utterly unbusiness like and suicidal. The folly of the thing is exposed by the consideration that if every one were to adopt the system of cutting, no one would be benefited and all would be impoverished. A proper respect for the welfare of others, not to say a sense of honor to the profession he follows, should be sufficient to deter every right-thinking man from a course that is lacking even in common sense.

Sixth. Last, but not least, there is a subject of great importance which vitally interests us all, as it has not a little to do with our bread and butter getting; a subject which, like Banquo's ghost, will not down. The question is largely ethical, and may be put thus: Why should wholesalers injure the business of their correspondents and customers by retailing over their counters goods in perfected packages at less than marked rates, and even at rates as contemptible as those offered by scalpers?

There are various other questions that naturally come before this Section, but I have called your attention to those I deem of the greater importance, and trust they will, at this time, receive your intelligent action.

The druggists of the country are looking to the American Pharmaceutical Association for direction and assistance to help them solve these questions rightly, upon which is based their commercial success.

And in conclusion, may I be allowed to say that nothing is to be more desired in our profession than that our business system should work smoothly and simply, and our commercial relations be free from everything that tends towards complication, expense and annoyance. It is most certain that, freed from unnecessary harassment, and having gained the time that comes of affairs well regulated, we might rise on business "stepping-stones to higher things."

It has been said that there is no high art without there first being leisure, and it is just as true that if the druggist is to reach that elevation which invites him, and gain that breadth of culture which may be his, and which his profession in its widest extent and entirety directly suggests to him, it will be when he is freed, by wise laws, wise methods, wise relations to others, and the wise conduct of his business, from the worry and care which too often now entirely engross him and bear him down.

It is ours, gentlemen, at this time and this place, to promote such an issue.

Mr. Rogers occupied the chair. A motion made by Mr. Eccles, seconded by Mr. Finlay, that the Section proceed to the discussion of the Chairman's suggestions seriatim, was agreed to. It was suggested that papers on commercial subjects be now read.

Mr. Wells, of Michigan, on invitation, read a paper on liquor legislation.*

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* A copy of this paper has not been received for publication in the Proceedings.—*Permanent Secretary.*

THE CHAIRMAN.—The first suggestion in the Chairman's address, is that "it should be held imperative, that no one should be received as an apprentice who is not of unimpeachable moral character, and who has not at least a thorough common school education."

MR. ECCLES.—I move as the sentiment of this Association, that we endorse that statement.

MR. WHELPLEY.—Mr. Chairman, I offer as an amendment to that motion, that the matter be referred to the Section on Pharmaceutical Education for discussion, as the same question will come up in that Section.

The amendment was accepted; and motion was agreed to.

THE CHAIRMAN.—The second suggestion refers to the necessity of an arrangement between the doctor and the druggist, founded on recognized business methods.

MR. HALLBERG.—I move that the suggestion be concurred in.

MR. PAINTER.—What is to be understood by business arrangements with the physician? What sort of business arrangements are they to be? The President's address mentioned about the making of an arrangement with the physician. These arrangements it is now suggested are to be made on a strictly business footing. It can only be a business arrangement to get the money into the pocket of the physician that came from the public through the hands of the pharmacists. That would be so construed by some as an arrangement with the physician based on business methods.

At the request of Mr. Remington, the Chair read the whole of the second suggestion of the Chairman's annual address.

MR. REMINGTON.—I fail to see that there is anything wrong in that. It is straightforward and plain, and I do not think it can be mistaken. There ought to be the plainest kind of a business arrangement between the physician and the pharmacist, and as I am particularly interested in the relation between the physician and the pharmacist, I feel very much like voting for the sentiment expressed by the address. I cannot see how it can be misconstrued.

MR. PAINTER.—What business arrangements have we with the physician?

MR. HALLBERG.—If in order, I would suggest that the last clause be modified so as to read "business as well as professional intercourse."

MR. PAINTER.—Our connection with the physician it seems to me is more professional, and I do not see that it includes business as well.

MR. ECCLES.—I suggest that the word "unselfish" be introduced before business. For I believe selfishness to be at the bottom of business, and if we were to eliminate that we would eliminate the whole trouble.

Allusion having been made that the phraseology might be construed to recommend the paying of a percentage on a prescription, Mr. Hollister explained that the business arrangement meant by him was the guarantee on the part of the pharmacist that all medicines furnished be of the best quality.

Mr. Finlay suggested the addition of the word "honorable" before "business methods;" Mr. Alexander favored the word "professional" instead; Mr. Eberbach agreed with this, but wished to have the word "business" left out entirely. This met the views of Mr. Hollister, who modified the sentence; and the second suggestion as thus modified was then concurred in.

Pending the consideration of the third suggestion that "Insurance calls for concerted action on our part," Mr. Whelpley moved, seconded by Mr. Sheppard, that the Druggists' Mutual Fire Insurance Company located at Philadelphia, and working under the auspices of the National Wholesale Druggists' Association, be endorsed or recommended. The motion was declared out of order, and the third suggestion of the chairman's address was then approved.

The fourth suggestion relating to the $25 U. S. revenue tax was read.

MR. ECCLES.—I am heartily in sympathy with the removal of the special tax of $25. That, Mr. Chairman and gentlemen, was special legislation; it was legislation undertaken during the war and in a special emergency. That emergency has passed by. The endeavor was then to raise money in any way we knew how; and licenses were demanded from every mercantile business. Every professional man, and every merchant had to pay a license. Now, unless you remove the tax from all branches of business, it is utterly useless to talk about removing it from the pharmacists. It has been said that it would be special legislation to make the attempt, and all the lawyers in the United States could not frame a law that would not be evaded in every direction and at every point. It is utterly out of the question to consider the possibility of removing the tax from the druggists without removing the tax from everybody else. The $25 license does not remove the tax from alcohol. It has to be removed from the distiller. It is a burden placed on him and on the arts and on every person who has to use alcohol; and it must be removed from the beginning to the end or you will not get the relief you seek. But to return: is it an evil to take this tax away? I do not believe that it is. There are three classes in the community; one abstains from the use of alcoholic beverages, the other extreme is the drunkard who drinks all that he can drink and makes himself drunk. Now if he could get all that he could drink for five dollars instead of paying ten for it, he would have five dollars left for his suffering family, while now the whole ten dollars go away from his suffering family. On the other hand, take those who only take a drink occasionally, when they meet their friends or at their meals, as the case may be; they are not going to be made drunkards by the removal of the tax; they do not want any more when they have satisfied their appetites. There is no monetary consideration that controls the appetite of human beings. A few are exceedingly stingy, and money consideration outweighs anything else; but as a rule, when people really desire a thing and appetite comes into the consideration, money is not considered until the appetite is gratified. Hence, I do not believe that the removal of this tax would affect the temperance cause in any way, either by increasing or decreasing the number of drunkards. Certainly every druggist and every doctor knows that we are not alone interested in the amount of alcohol we sell out of the store, but mainly in that which is used in our tinctures and for extracts and alkaloids. Is not this tax on the alcohol used by the pharmacist and the physician directly and indirectly much greater than the tax on diluted alcohol drank as a beverage? I think if you will notice the number of ways in which it is used in the arts and in the different preparations, you will find that the relief to the druggists will only come when the tax is all removed. I am certain if you will raise the tax on alcohol you will raise the price of articles furnished to the suffering sick. It is therefore pronouncing sickness to be a crime. It is simply saying to the sick, you shall pay a fine and a penalty of so much money for being sick. That is what it amounts to. You will find that the use of alcohol in these various directions is far greater, and that the nation, so to speak, is robbing the sick and suffering far more than it is robbing the drunkard or those that are inclined to be drunkards.

MR. SHEPPARD.—It seems to me, sir, that it is not necessary to mix up the question of the $25.00 tax on the druggists of the United States, and the tax on whisky and alcohol; and it is my opinion that it is better to let that alone, because with it we strike directly into the realm of politics.

Mr. Alexander occupied the chair. Mr. Painter raised the point of order, whether the discussion was on the recommendation of the Chairman's address. The chair ruled the point of order to be well taken. Reference was made by several members to bills now before Congress, which were stated to contemplate the removal of special license taxes. Objection being made to the endorsement of any such bill that could not be read in full before the Section, Mr. Hallberg moved to amend the Chairman's suggestion by requesting Congress to repeal all special license taxes for the sale of alcoholic liquors. The amendment was carried by a vote of 50 yeas to 13 nays, and the motion as amended was agreed to.*

The statements in the Chairman's address in regard to the cultivation of medicinal plants in the United States were read.

MR. COLCORD.—I think that we had better defer this. We have been trying four or five years, and have reached no result.

MR. REMINGTON.—There is one point in connection with this subject that it seems to me requires a little discussion. It is in relation to the cultivation of the poppy plant for the production of opium. The poppy plant has been cultivated successfully in many parts of the United States, in Virginia and in Vermont, in South Carolina and in Georgia, and out West in Minnesota and in Illinois; but in the manufacture of opium there is a very grave question involved, the question of labor for harvesting it in sufficient quantity, and cheap enough to compete with the foreign product.

The fifth and sixth suggestions of the Chairman's address, relating to the "cutting" of prices and to the retailing by wholesale dealers, were read, and Mr. Canning moved that both suggestions be endorsed.

MR. HALLBERG.—I have a word to say for the benefit of those present, that while we have probably as many selling at such prices in Chicago as in any large city, we have only had three cutters within the last four years. Two of these cutters were driven out. One had four stores, and he was closed up by the sheriff six months ago. The second one had to take out a five hundred dollar license for selling liquor in violation of the laws, and he is just about done for. The other one died last winter.

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*A similar resolution was passed by this Section in 1887. See Proceedings, 1887, p. 522.—EDITOR.

The question being on endorsing suggestions five and six of the Chairman's address, the motion was agreed to.

Mr. CANNING.—As my resolution formally refers somewhat to the sentiment expressed in suggestions five and six, I think it would not be out of order at this time to act upon it. It was referred to a committee this afternoon, and we have formulated the following resolution :

Resolved, That this Association requests the manufacturers in the rebate system to furnish no rebate goods to any firm or party retailing such goods, however large the quantity they may desire to purchase, and asks the co-operation of the National Wholesale Druggists' Association in carrying out such action ; *Provided*, That this be not considered to apply to such wholesale drug firms as may sell such goods at retail only in distinct and separate retail pharmacies.

Mr. PAINTER.—I move the adoption of the resolution.

MR. SHEPPARD.—While I wish that this could be brought about, I am afraid that we should have to wait for the millennium for it to come, and I think it very unwise to take any action in that direction. The wholesalers have retailed and go on retailing ; but it does seem to me as if it were possible for us retailers, in some joint way, to bring about a combination which should be helpful to us in an honorable way, as the wholesalers have done in the rebate plan. I think our efforts should be applied in that direction ; but I confess that it is an exceedingly knotty question, and although I have thought it over for a long time, I cannot come to any feasible solution of it. While I have no objection to this resolution as offered, I think that it is simply useless. We should direct our attention to the rebate system, and I believe we could evolve some plan out of that which shall be honorable to the manufacturer, to the wholesaler and to the retailer. We all know that there are a large number of retailers who can well afford to buy the goods in large quantities, and it appears possible to have some honorable plan by which a thousand or two thousand well to do pharmacists could join hands and buy goods in large quantities, and if it were proper, to get that ten per cent. rebate. Of course, we must admit the justice and equity of the ten per cent. rebate for handling the goods by the jobber. When a man does work, as he does, for the retailer, he has a right to be paid for his work. When the retailer buys the same quantity from the manufacturer he does his own work, and I think that he should be allowed that same rebate as the jobber gets. But as we look closely into the subject we will find that if that plan was adopted the manufacturers' association in the present rebate plan would be at once broken to pieces. I do believe that if the members of this Association would try individual work on that point, we might evolve some good plan.

MR. BASSETT.—I have been exceedingly interested in the proceedings for the last few minutes, and it has only been diffidence on account of my being a young member of this American Pharmaceutical Association that has kept me still. I was very much pleased, indeed, to see the endeavor on the part of this Association to abolish the tax on alcohol. You have done away with the cutters, and now you want to regulate the manner in which we shall buy the goods. Now, gentlemen, I think it is time that we should call a halt. There is one underlying principle in business that no man can put his foot on, and that is, when a man puts his money into it, he has a right to buy goods where he can get them the cheapest, and to sell them where he can get the most for them. You decry the wholesalers for retailing, and I agree with you in that. You want to stop them from doing that so that you can get more money out of your business. You want to stop us where we can buy the cheapest. I do not agree with you. I tell you, gentlemen, you have a contract on hand which you cannot carry out, because, just so long as men are in business and have their money in it, they will buy where they can buy the cheapest just as long as they have got the money to pay for the goods. Now it sounds very well to offer a resolution of this kind, but what good does it do? We have had various plans for the regulating of business. We have had the Campion plan here a few years ago, and they stood by it in our State Associations, but it did not last. The Campion plan is dead; it died in less than six months; and every other plan for regulating another man's business will die a natural death in a short time. It is wrong, and you cannot carry it out, and I hope you will drop this subject and not attempt to regulate another man's business.

Mr. Hallberg.—This subject was discussed this afternoon, and the sentiment of the Association was largely in favor of the resolution. It looked afterwards in the discussion as though it ought to be modified somewhat. It was turned over to the Committee; the Committee went over the ground very carefully, and after further consultation, has finally modified it as read by Mr. Canning a little while ago. Now we ought not to pass that resolution except before the whole Association. Still, if it were passed, I believe it would have a good moral effect. In connection with this, I desire to say in reply to a remark made by one of the members, that while the question of money regulates almost everything in this country, it does not regulate the health of the community. Every State is given a police power, and if necessary, power to take away every cent of property a man has got in order to protect the health of the community. Pharmacists at the present time are not the only parties allowed to sell patent medicines. It is our fault that some men do not assume a corresponding responsibility attached to it. I hope before long to see the time when we will be the sole purveyors also of patent medicines, and when nobody else will have the right to sell them. While we are getting at that point nearer and nearer, in the meanwhile we have a right, at least the privilege, to indicate to wholesale dealers that we shall be protected to a great extent in the profit in selling the goods. When a man puts his money into medicine, he has a right to do what he pleases with the money. Unfortunately, that is true to a great extent at the present time; but the Wholesale Druggists' Association will admit that we have a right to come to them in a proper spirit and make a proper representation that they should not injure our business and our professional standing. I believe that they will say, Gentlemen, your demands are only just, and we will do the very best we can in order to fix this matter up. Therefore I would like to see this resolution passed that has been handed in by Mr. Canning.

Mr. Eccles.—Mr. Hallberg made the only defence that is satisfactory to meet that resolution, and that is the establishment of a moral sentiment; and I shall vote for this resolution, although I do not believe it will be effective I believe that it will be ineffectual in many ways, if it were possible that it could be carried, and even if it could be carried it would work harm. In illustration, I will call your attention to the principle that is enunciated, in the doctrine of evolution, which many of you believe, and others do not believe. I simply use it as an illustration of what will occur here. According to evolution as enunciated, progress is going on, and any animal that has gone a good way ahead has become adapted to his situation, and has left the original animal away behind him, and there is a great difference between them. This is the case with animals and with plants. They are gradually adapted to their situations, and those that are not perfectly adapted are between the upper and nether mill-stones, and are ground out, and so it is that the middle classes are crushed out and this separation of genera and species occurs. The same principle is illustrated here in the statement of the resolution. We are establishing a ground for the crushing out of all possible ascendency from the retail to the wholesale business. We must remain retailers or wholesalers, because if we attempt to work ourselves out, this resolution grinds us out from any chance of gaining any profit, and if the same logic is carried into all other classes of goods, so that we shall not get anything in the shape of rebate, or an extra amount of profit, or greater inducement for buying big lots than little lots, why the chance of the retailer ever becoming a wholesaler is out of the question. Suppose I start as a retailer on a small scale in a small town on the Mississippi river, where it is convenient for me to buy and sell to my neighbors, and I have a sort of nucleus for beginning a wholesale trade, it being the proper region for it; so I begin to buy and sell at retail and at wholesale in the same building. But can I never become a wholesaler? Only the man who can buy goods at the cheap rate will be able ever to become a wholesaler. I think that you will see the point. The principle involved is the crushing out of the middle ranks, keeping us as retailers, and never giving us any chance to become wholesalers. It seems to me a great evil is to be found in this principle. If this resolution is in accord, then the cutters, I am sorry to say, are not being killed out in Brooklyn as they are in Chicago; for there they are prospering and increasing in the number of their stores steadily all over the city, and they are spreading out like the tentacles that are supposed to take everything in. Now, I think that the resolution will stop this class of firms from getting goods, and they are the most dangerous. As an expedient for the present, we ought to try to establish a moral sentiment in the community to educate the pharmacists.

MR. HALLBERG.—That would be practically to confine the operation to the larger cities. Now we do not want any retailing done by wholesalers in the larger cities. I speak of cities that have about 100,000 inhabitants. I refer to the wholesaling and retailing at the same time.

MR. ELIEL.—I hope the resolution as offered will not pass. The reason has been so eloquently and forcibly stated by Dr. Eccles, that I cannot add anything to it to make it more plain. Nor do I think that the resolution in that shape will avail the gentlemen in large cities, especially those in the east, where it is sought to be adopted. I am fully satisfied that the manufacturers of proprietary articles would never leave anything to the retail druggists who do not buy a great many goods. Some retail druggists now purchase in jobbing quantities, and buy everything that they can buy without being shut out. If this goes on the crushing out will begin right among ourselves. It is simply a question whether we will stand in our own way.

The question being on the resolution offered by Mr. Canning, a division was called for, and resulted in 25 yeas and 22 nays; the resolution was therefore carried.

Mr. Hallberg regarded the argument of Mr. Eccles as convincing, and Mr. Canning stated that Mr. Eccles' arguments had changed his views, and moved for a reconsideration of the vote, which motion was adopted.

Mr. Sheppard now offered the following substitute for Mr. Canning's motion, which was seconded by several members:

Resolved, That it is the sense of this Association that some arrangement should be made by the Manufacturers' Association by which a combination of retail druggists shall have the benefit of the rebate.

Resolved, That a copy of this resolution be forwarded to the Manufacturers' Association.

MR. SEABURY.—This question has been debated for the last four or five years by the retail trade, and the retailers understand it. You have all the power you want, if you would only use it. You have only got to combine and to stand together. You cannot do it by your own individual efforts. The case demands a heroic treatment. A gentleman told me that the retailers in this city would boycott every wholesale druggist if they sold goods at retail or sold to physicians. This means that all the Detroit druggists have stood together. If you will do that you will have no trouble. The situation in the city of Brooklyn would never have been as it is if the druggists had stood together, but they have got "confusion worse confounded." Each man is afraid of his neighbor. The consequence is that the whole city is fringed with stores. Now I remember the time when we had our fight in New York, and when the Druggists' Union was established. For a time it was very strong, and they stood up for each other for a little while. They went to the wholesale dealers and said to them "We do not want you to retail in every direction, and if you do you must retail at the full price, or sell no goods at retail at all, as this is our legitimate business." They signed and kept the agreement for about three weeks, until our New York Retail Druggists' Association went to pieces They would not stand together, and you will never succeed in this scheme, or Mr. Sheppard's scheme, or anybody else's scheme, unless you unite and become solid. If you find one of these fellows is cutting, you must get right alongside of him and cut the gizzard clean out of him.

Mr. Bassett.—Dr. Eccles has made an argument, and I am very much obliged to him and to Mr. Canning. Now Mr. Sheppard wants to formulate a new plan. In other words, he wants to go to the wholesalers and ask them if we may do a certain thing. Why do we want to ask if we may buy goods of them in a certain way? He wants to form a combination between the manufacturer and the jobber to buy goods in a certain way. Form your combination, say nothing to them, and go and buy, and you will get your goods every time you pay for them. Let me illustrate. About two weeks ago a firm which I know wanted a certain article; they could not get it in this city, and they sent to New York for it, and got a very nice letter back, saying that they did not want to sell to us, since we were not a jobbing house, but were in the retail business exclusively, and that a wholesaler had bought the same goods of the same house before. We sent to our brokers and told them to buy for us, and the result was that the same goods came to us billed direct from the house that had refused to sell to us in the first place. I think if we want to get the goods we will get them every time. The only thing I object to in the resolution of Mr. Canning is that it proceeds on the basis that a man should pay just as much if he buys a gross of goods in proportion, as he does who buys only one bottle. This is wrong: the man who buys the most goods has the right to buy them the cheapest if he buys them at one time, and you cannot get away from that principle. I oppose Mr. Sheppard's motion, because I think it is entirely useless for us to ask people how to do business. Let us stand up together, and do business in a practical way, and attend to our own business.

Mr. Hallberg.—Does not the quantity of goods determine the matter of rebate?

Mr. Bassett.—It always does.

Mr. Hallberg.—It all depends upon the amount you buy. If you buy so much, you will get the rebate.

Mr. Bassett.—No matter what it is, if you buy the quantity, you get the rebate.

Mr. Hallberg.—Then if a co-operative Pharmaceutical Company, wherever located, wanted to buy so many goods, they could get the rebate; otherwise, not.

MR. COLCORD.—It cannot be divided, that is all.

MR. HALLBERG.—I do not see how we can make any arrangement, taking that principle into consideration.

MR. DADD.—In Milwaukee they have done very carefully what Mr. Seabury suggests. They have united as a State Association, and have asked the wholesalers if they retailed any goods, to retail them at the market price. We did that for three years, and we keep that in full force to-day. If there is anything like cutting, or we have any suspicion of it, we wait upon them and suggest that the thing is not being done right, and then it is immediately corrected, and we have no difficulty in carrying that out. We have been working under that arrangement for two years.

MR. COLCORD.—The jobbers will pretend that they do not retail, but still they do it on the quiet.

MR. REMINGTON.—I have been very much interested in the debate, and there is one point of this subject which has been especially interesting to me. Mr. Seabury has struck the key-note of this matter of redress that you are asking for at the present time, and that will never come until there is a bond of union amongst the druggists, they standing shoulder to shoulder and working together. Now I would like to know why it is possible to effect that in places like Milwaukee and Detroit, and some other places, and why it cannot be done at all in Boston, New York, Philadelphia, Baltimore, and some other places? Why is it not possible in the larger cities of the country, and is possible in some cities that are not quite so large?

MR. PAINTER.—The reason is that there are more people there. Where there are three or four men of one opinion, it is more difficult to get a jury of twelve men or a larger number to agree. Of course, the more diversity of opinion there is, there will be men who will not come in, and you cannot force these men into these druggists' unions as they tried to do in New York. It was because of this failure to stand united that the cutters were established, and secured the firm basis they now have. If it had not been for the Druggists' Union the cutting business would not have been so bad in the United States as it is to day. That very thing built it up in New York, so that it is impossible to overcome it. The cutters grew at that time and became strong, and they are of such strength now that they make their own terms. Almost every pharmacist in the city of New York is a cutter, and they will remain cutters. They are down to the very lowest prices, and former prices can never prevail again, and this is just because of this Union. You cannot get the men to come in. You cannot take a shot-gun, go out after them, and say, You shall come in. He has a right to do as he pleases.

MR SHEPPARD.—If any wholesaler made any such statement as that, I would say that his signature to that paper was no good, because they have all signed an agreement that they would not do any retailing.

MR. COLCORD.— That is all very good, but they do it just the same.

MR. CANNING.—It would appear that in the East we are rather behindhand in this arrangement, which seems to succeed in the West. The situation seems to be entirely different. How much good would it do if all the druggists of Boston would unite and pass resolutions and carry them into action, when you reflect that there is one house there that can buy them all, soul and body, and snap their fingers at them, and still cut? What will you do there?

MR. SHEPPARD.—I want to answer Mr. Bassett's remark about taking into our hands a co operative association to buy goods. I buy a certain quantity of some proprietary articles and have to sign a contract that I will not divide. If I propose to keep the contract whether it takes money out of my pocket or not, I cannot undertake this alone. I want to be able to buy these goods, and to have the right to buy them with a half a dozen persons joining in the scheme.

MR. ECCLES.—The point raised by Mr. Seabury two or three years ago, when this question was up in Brooklyn, was a good one. The answer that I gave him applies to-day just as it did then. I told him then that they would advertise a bolting company and would increase the amount of the sales of that company by their efforts at the Union; and I pointed out another way in which the Union would have destroyed every cutting establishment in the city of Brooklyn, and the same kind of Union would have destroyed every cutting establishment in the United States. It is simple and brief, and it commends itself to every business man. All that is needed is unity. The plan then was this: That every druggist should not only match a cutter in cutting, but cut below the actual cost price; that is the only remedy, and if every druggist in the city of Brooklyn would do that, it would finish the business. Send a man or a woman to the store of the cutter and keep his clerks busy all day selling cut goods, and give him no chance for selling anything else; and if you keep him busy from morning till night—and it can be easily done—selling nothing but cut goods, he will wish he had never gone into cutting.

MR. HALLBERG.—I think I can answer Prof. Remington's query. He wants to know why such unity can not be had in Boston, Philadelphia and New York, and why we have it out West? It is because you do not enforce your pharmacy laws in the eastern States; that is the reason. If you pursued the same plan that is pursued in the city of Chicago, the Board of Pharmacy would watch, and the minute the establishment was run without a registered employee—and we would take great care that they did run without a registered clerk—then there would be a fine, and so it would get to be a tiresome business. You have your remedy in your own hands; it is the law, and if it is properly executed you can get relief; but you must execute it. In Illinois the Board prosecuted every man that violated the law. We have nearly eight hundred prosecutions under the law. That is the way we make it effective.

MR. REMINGTON.—Suppose that one keeps strictly within the law. We have a number of such men in the city of Philadelphia, who conform to the law.

MR. HALLBERG.—A cutter, owing to the scarcity of clerks, is liable to violate the law, and then he should be prosecuted.

MR. DE FOREST.—I did not intend to speak upon the question at all; but as Mr. Hallberg has particularly referred to Brooklyn, and it has been mentioned also by Dr. Eccles, I would state that we have been working under the pharmacy law for the last five years, and that the cutters in Brooklyn have had no trouble whatever in reference to registered clerks; in every instance, no matter if they were changed two or three times a week, they have had their clerks registered; and if the man could not pass examination, he was immediately sent off. So you will see that plan will not break up the cutters. I do not think the charge can be made against the Kings County Board of Pharmacy that they have not administered the law, because it has always been acknowledged that the law in Kings County has been administered as well if not better than in any other part of the country.

The resolutions were then read again, and on motion were indefinitely postponed.

The Chairman announced the appointment of the following members of the Committee on Commercial Interests, for the ensuing year: L. Eliel, of Indiana; C. Holzhauer, of New Jersey; and W. M. Searby, of California.

The Committee on Exhibits being called upon, Mr. Wilcox asked for a definition of what would be considered the "best general exhibit." Mr. Remington referred to the objects of the Association as expressed in the Constitution, and suggested that these would afford a guidance for the judgment of the Committee. The subject was further discussed by Messrs. Eccles, Macmahan, Painter, Hallberg, Canning and others, when on motion of Mr. Painter the Committee was requested, in the awarding of prizes, to take into consideration everything admitted to the exhibit.

On motion of Mr. Sheppard, the Committee was authorized to report fully to the Association at the last session, on Friday morning.

The Section finally adjourned at midnight.

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION, WEDNESDAY MORNING, SEPTEMBER 5TH.

The Section was called to order by J. M. Good, who stated that he did so as an associate member of the Committee, in the absence of the chairman and secretary.

On motion of Mr. Remington, seconded by Mr. De Forest, the Section proceeded to the election of officers for the ensuing year. Messrs. Good and Ebert were nominated for chairman; but both declined and were excused. Mr. Painter was nominated and was elected by ballot cast by the chairman.

Mr Remington nominated H. M. Whelpley as secretary of the Section, and he was elected in a similar manner. Chairman Painter then appointed Mr. R. G. Eccles the third member of the Committee for the ensuing year.

On motion of Mr. Painter, Mr. Good was requested to preside over the Section during the present meeting; and on motion of Mr. Remington, the secretary for the ensuing year was appointed secretary for this meeting.

The following paper was read by Professor Prescott:

ARTIFICIAL SALICYLIC ACID.

Notes upon methods for estimating the quantities of homologous acids present.

BY ERWIN E. EWELL AND ALBERT B. PRESCOTT, ANN ARBOR, MICH.

Of the homologous phenols associated together in the distillates of coal-tar, the first member is the chief constituent of ordinary carbolic acid, but, it is well known, the higher members are not altogether absent. Considerable percentages of higher phenols are common in carbolic acid. Since salicylic acid is in greater part manufactured from carbolic acid by Kolbe's process,* inquiry naturally arises as to what becomes of the higher phenols of carbolic acid used in this manufacture. It had been found some time ago † that when the higher phenols of carbolic acid are treated as they are in Kolbe's method they are changed into homologues of salicylic acid: the cresols into hydroxy-toluic acids ($C^7 H_6.OH.CO_2H$), and the xylenols into hydroxy-xylenic acids ($C_8H_8.OH.CO_2H$), just as phenol proper is changed into a hydroxy-benzoic acid.*

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* KOLBE, 1874: *Jour. prakt. Chem.* [*2*] *10*, 89; *Jour. Chem. Soc.*, *28*, 260; *Watts's Dict. Chem.*, 7, 1065; *Proc. Am. Phar. Assoc.*, *23*, 374; *27*, 463. SCHMITT, 1885: *Jour. prakt. Chem.* [*2*] *31*, 397–411; *Jour. Chem. Soc.*, *48*, 982: *Phar. Jour. Trans.* [*3*] *5*, 421.

† BIEDERMANN and PIKE, 1872: *Ber. d. Chem. Ges.*, *5*, 323; *Watts's Dict.*, 7, 394; *8*, 2023.

The presence of some other acids besides true salicylic acid (ortho-hydroxy-benzoic acid) in the article of salicylic acid of commerce was reported by Mr. Williams in 1878.† He found the calcium salt of the foreign acid to be much more soluble in water than calcium salicylate is. By neutralizing a hot aqueous solution of salicylic acid with calcium carbonate, causing the salicylate of calcium to crystallize out as completely as practicable, and then acidulating the mother liquor, the unknown acid was obtained. In certain physical characters this acid was found to be distinctly different from salicylic acid and from the other two hydroxy-benzoic acids. In the leading chemical reactions, however, the unknown acid was found to agree with salicylic acid and the isomers of the latter. The acid liberated from the crystals of calcium salt, after purification, was found to agree in all points with true salicylic acid. Mr. Williams concluded that the acid not salicylic formed 15 to 25 per cent. of the better grades of salicylic acid of the market. Very little further investigation of the presence and proportion of the homologous acids has been reported. In 1883 Dr. E. R. Squibb‡ gave the opinion that "the better grades of the well-crystallized acid of the market contain 4 to 5 per cent. of something which is not salicylic acid," and for which, he says, he knows no test.

The physiological and therapeutic value of the homologous acids in medicinal salicylic acid is certainly deserving of careful study, in view of the large doses in which the agent is used and the somewhat variable effects reported of these doses.

I. A METHOD BY ACIDIMETRY.

The molecular weights of the homologous acids show the following differences, those of $CH_2=13.97$, in arithmetical increase.

Salicylic acid (hydroxy-benzoic acids), $C_6H_4.OH.CO_2H=137.67$.
Hydroxy-toluic acids, $C_7H_6.OH.CO_2H=151.64$.
Hydroxy-xylenic acids, $C_8H_8.OH.CO_2H=165.61$.

And of hundredth normal solution of alkali $\left(\frac{N}{100}\right)$ needed to neutralize these acids and form monobasic salts:

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* The ortho-compound, $C_6H_4.OH.CO_2H$ ($OH : CO_2H=1 : 2$). The isomers and their homologues are given in Prescott's Organic Analysis, pp. 394, 434, 443.

† J. WILLIAMS, 1878: *Phar. Jour. Trans.* [3] *8*, 785; *Proc. Am. Phar. Assoc.*, *26*, 536.

‡ *The Ephemeris*, *1*, 411, Nov., 1883.

1 gram of salicylic acid requires 726.3 c. c.
1 gram of a hydroxy-toluic acid requires 659.4 c. c.
1 gram of a hydroxy-xylenic acid requires 603.8 c. c.

In the application of this method, it was assumed that hydroxy-toluic acids, $C_8H_8O_3=151.64$, fairly represent the total acids of molecular weight above that of salicylic acid. This can be justified both because there can be only a very small quantity of xylenols in carbolic acid of respectable quantity, and because a given percentage of the xylenol product would indicate a larger percentage of the less objectionable cresol-product. Thus, of the $\left(\frac{N}{100}\right)$ alkali solution to neutralize 1 gram of the acid,

Hydroxy-toluic acids take 66.9 c. c. less than salicylic.
Hydroxy-xylenic acids take 122.5 c. c. less than salicylic.

One per cent. of a hydroxy-xylenic acid would indicate 1.8 per cent. of a hydroxy-toluic acid. Then *the saturating capacity of articles of "salicylic acid"* made from carbolic acid, will stand as follows:

FOR ONE GRAM OF THE ACID TESTED.

Salicylic acid, absolute,	726.3	c. c. $\frac{N}{100}$	alkali.
" " with 5% hydroxy-toluic,	723.0	"	"
" " " 10% "	719.6	"	"
" " " 15% "	716.3	"	"
" " " 20% "	712.4	"	"
" " " 25% "	709.5	"	"

In making trial of the calculated saturating powers of salicylic acid and its homologues, potassa and soda were found to work equally well in the standard solutions $\left(\frac{N}{100}\right)$, and phenol-phthalein proved thoroughly satisfactory as an indicator of the end-reaction, while litmus is wholly incapable of being used in this estimation. *The titrations are to be made as follows:*

About a fifth of a gram of the acid to be tested, dried at or below 65° C. to constant weight, is accurately weighed, placed in a beaker of about a half liter's capacity, some drops of the (alcoholic) solution of phenol-phthalein added, and (without adding water for solution) the hundredth-normal solution of alkali is run in from the burette, while stirring, until the end-reaction is approached. The beaker is now placed upon wire cloth over the flame (or otherwise promptly heated) while gently stirred, only long enough to complete the solution of the acid, and without decided boiling, when the heat is removed, the beaker-sides rinsed down with a little distilled water, and the titration completed. The weight taken : 1.000 : : c.c. required : x=c.c. for one gram, to be compared with the table above.

In drying salicylic acid for a constant weight, it was found that this could be attained at 65° C., while at 70° to 75° C. there was a constant loss, in a short time sufficient to be registered by the balance. A portion of the purified acid from oil of wintergreen, placed between watch-glasses arranged for sublimation, and heated to 115° C., promptly gave a sublimate of colorless crystals of good size. In aqueous solution, it suffers loss by boiling at common air pressure.

Acidimetry under the directions given above was tried upon a sample of purified acid from oil of wintergreen, a sample prepared for the purpose, in the way followed by Williams:[*] one ounce of oil of wintergreen was saponified by potassium hydrate solution, the liquid cooled and acidulated with hydrochloric acid, the precipitate four times crystallized from boiling water, the hot solution filtered through strictly purified animal charcoal and recrystallized, and lastly twice recrystallized from alcohol. The average of several titrations of this purified salicylic acid agreed very closely with the calculated quantity, 726.3 c.c. $\left(\frac{N}{100}\right)$ alkali for one gram of the acid.

Applying the same volumetric reagents in the same way to a sample of salicylic acid of the ordinary market,[†] in four titrations an average of 714.3 c. c. was obtained,—corresponding to a proportion of 15 to 20 per cent. of homologous acids calculated as a hydroxy-toluic acid.

With titrations of good ordinary care, using verified instruments of such delicacy as every chemist requires for analytical work, acidimetry can reveal quantities of hydroxy-toluic acids as low as four or five per cent., other interfering impurities being absent.

II. A METHOD BY CONVERSION TO PHENOLS.

When salicylic acid and its homologues are distilled from lime they yield a distillate of their respective phenols, the elements of carbon dioxide being retained by the lime, so far becoming a carbonate. Subjecting commercial salicylic acid to this reaction, it was undertaken to apply to the distillate a limit test for composition of the produced phenols, namely the test[‡] by adding an equal volume of nine per cent. solution of sodium hydrate, and then noting the number of volumes of water to be added to cause beginning precipitation. Experiments were undertaken, with mixtures of a fairly representative "cresylic acid" and good carbolic acid, to obtain limits of dilution for each 5 per cent. addition of cresol in the mixture.

A "cresylic acid" of the market, of specific gravity 1.04, was found to yield results so far consistent that it was taken as an approximately representative cresol. Best carbolic acid of the market, with water just enough to liquefy it, was taken as phenol. From mixtures of these imperfectly pure articles, preliminary data were obtained, as set forth in the following table:

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[*] *Phar. Jour. Trans.*, [3] *8*, 785.

[†] In appearance the sample was an indistinctly crystalline powder of a slightly pinkish color.

[‡] A. H. ALLEN, 1878: *The Analyst*, *3*, 321; "Allen's Commercial Organic Analysis," *2*, 551; "Lunge's Coal Tar Distillation," 63.

Volume per cent. of cresol in the distillate.	Calculated weight per cent. of hydroxy-toluic acid distilled.	After adding an equal volume of nine per cent. sol. of soda, number volumes of water added before precipitation.
5	4.9	6.7
10	9.8	6.0
15	14.8	5.25
20	19.8	4.5
25	24.7	4.0
30	29.7	3.6
35	34.7	3.3
40	39.7	3.1
45	44.7	2.8
50	49.7	2.6

The conversion of the "salicylic acid" into its corresponding phenols was done as follows: 15 grams of the acid and an equal weight of lime are thoroughly dried, well triturated together, placed in a glass retort, put over a strong heat, and quickly distilled, collecting the distillate in a well-cooled receiver. To promote the distillation with great advantage, dried iron filings may be added in equal quantity to the contents of the retort. When the distillate is complete, it is liquefied by adding just enough water.

The sample of commercial salicylic acid previously tested by the method of acidimetry was subjected to this process, and the distillate tested by an equal volume of nine per cent. sodium hydrate, and subsequent dilution with measured water, until after stirring there remained visible precipitation. Five volumes of water were required, indicating, according to the table above, some proportion of hydroxy-toluic acid between 14.8 and 19.8 per cent., and agreeing substantially with the result by acidimetry.

It appears evident that a method by conversion of phenols can be made effectual for the estimation of homologous acids in the salicylic acid in use, and probably with closer results than those obtained by acidimetry.

III. SEPARATION BY SOLUBILITY OF THE CALCIUM SALTS. THE METHOD OF WILLIAMS.

This method, cited in the beginning of these notes, was the basis of the only estimation of the quantity of homologous acids in artificial salicylic acids which has come to the notice of the writers, and they have submitted it to a careful trial. The operation directed by Williams* was conducted three times, successively. The products of each operation, that is, the salicylic acid of assumed purity on the one hand and the homologous acids assumed to be free from salicylic acid on the other hand, were subjected to estimation by the method of acidimetry.

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* 1878: *Phar. Jour. Trans.* [3], *8*, 785; *Proc. Am. Phar. Asso.*, *26*, 536.

In each of the three operations the salicylic acid was obtained from the crystals of calcium salicyate in excellent crystals, and in each case acidimetry gave results for pure salicylic acid. The mother liquors, treated for separation of the homologous acids,* yielded acid agreeing with that described by Williams, acid differing greatly from salicylic in physical properties. This "homologous acid," subjected to acidimetry, gave, for one gram of the acid, (1) 705 c. c., (2) 699 c. c., and (3) 697 c. c. of the hundredth-normal solution of alkali, the average being 700.3 c. c. By the average of these estimations, then, the "homologous acid" still retained 61 per cent. of salicylic acid against 39 per cent. of hydroxytoluic acids, and in estimation (3), where the separation was carried further than in the other two trials, there remained over fifty per cent. of salicylic acid. Indeed, the process of crystallization does not promise well for estimation, unless by some system of allowances and for an approach toward exact determination.

University of Michigan, *August*, 1888.

MR. REMINGTON.—To which of these methods does Prof. Prescott give preference? If practical, the one by acidimetry?

MR. PRESCOTT.—To acidimetry. I should wish the work to be tried by other hands; but I think that for a pharmacopœial method, perhaps, this would be found practical in ordinary hands.

MR. REMINGTON.—In reference to the solubility of the calcium salts, is there not a liability to some uncertainty in the estimated results, due to the greater solubility of one of the salts in the solution of the other salt? If one salt will be partially a solvent of another salt, that would tend to vitiate the results.

MR. ECCLES.—Professor Prescott says he can come no nearer than five per cent., by that method.

MR. FENNEL.—This would not vitiate the results.

MR. PRESCOTT.—No, sir.

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* The acid not salicylic has usually been designated in the singular number, and it may be that only one homologous acid occurs in the manufactured article. But as there are three isomeric hydroxy-toluic acids, to say nothing of the hydroxy-xylenic, and in absence of any identification of these isomers in "homologous acid," it is well to recognize their existence in the plural. Melting points of the hydroxy-toluic acids have been reported as follows:

Acid—$CO_2H:OH:CH_3=1:2:3$—melting at 160°C.
Acid " " " $=1:2:4$— " " 173°C.
Acid " " " $=1:2:5$— " " 151°C.

The following paper was read by Dr. Eccles:

CALYCANTHUS SEED.

BY R. G. ECCLES, M. D.

At the meeting of the Torrey Botanical Club, of New York city, in December, 1887, Mr. E. E. Sterns exhibited specimens of the fruit of Calycanthus glaucus, Willdenow, which he had received from Mr. J. H. H. Boyd, postmaster of Cagle, Sequatchie county, Tenn. A letter from Mr. Boyd was read, which, with other interesting information, contained the following: "Hundreds of cattle and sheep have died here in the past five years from 'bubby' (the local name of Calycanthus). The seeds only are poisonous. When a brute gets a sufficient dose, from five to ten well-filled pods, it makes for the nearest water and often falls dead while drinking, or it may live three or four weeks and then die. The symptoms are like those of a man extremely drunk, except that any noise frightens it. Stamp the ground hard close to a brute poisoned with 'bubby,' and it will jump and jerk and tremble for several minutes. That is our method of telling when they have taken it. The eyes turn white and glassy, and while lying they throw back the head and look as if dead already. 'Bubby' does not seem to hurt a brute much if it cannot get water. Our best remedy is apple brandy, strong coffee and raw eggs, poured down as soon as possible after finding. It is certain that 'bubby' is the most poisonous of any shrub or weed in existence here, from the fact that when brutes have once eaten it they will take it every time they can get it. It grows on every hill-side, along all branches (creeks), in fence corners, and almost everywhere here."*

Men living miles apart have told the same story of the effects produced by eating the achenia. The loco or crazy weed of the West has had a similar reputation, but chemical investigation failed to discover anything to which such therapeutic effects could be attributed. With calycanthus, however, we have the testimony of intelligent observers as to its toxic effects. Dr. B. W. Sparks, of McMinnville, Tenn., writing to Mr. Sterns under date of June 11, 1888, says: "In regard to the 'bubby,' 'Sweet Shrub' (Calycanthus glaucus, Willd.), if you asked me, 'Do I believe this plant to be poisonous to cattle and sheep?' most assuredly it is. It will poison cattle, sheep, goats, deer, and all other ruminating animals, but does not have any effect on the horse, mule and ass. At least, this is my experience. It will poison the squirrel, rat and dog, when ground or unground. I cannot speak for the hog family. I have known and made many experiments on rats and dogs; it is as sure death to them as strychnine or arsenic; symptoms in over-doses identical with those of strychnine, which I need not repeat. In my opinion it has an alkaloid allied to strychnine."* During the last week of January and the first half of February, your essayist occupied all available spare time in endeavoring to isolate any active principle the suspected achenia might contain. The results were so far successful that an alkaloid was isolated and named calycanthine, from the genus of plants in which it was procured. Another alkaloid was then suspected, which subsequent investigation failed to isolate, although there are still indications of its presence. At one time it seemed as if it had been secured, but this turned out to be albumen and not the alkaloid. In reporting the discovery to Brooklyn pharmacists, the following description of the fruit and plant was given: "The fruit is about the shape and size of a pear, but contains no pulp, being merely a dry, brittle shell, within which twenty or more large dark-brown achenia are found. As they are loose, it could be used for a rattle box for a child. The achenia are about the size and shape of those from a large sunflower, but shorter in proportion to their length, and rounder at the ends. For a long time Calycanthus florida, an allied species, has been prized as a garden shrub, but no one has ever thought of seeking for an alkaloid in the seeds of any of them. The leaves, bark and flowers of all are well charged with an essential oil that makes them merit the title "sweet scented shrub." The flowers are of a purplish-brown or chocolate color, and when squeezed emit an odor very much like that from strawberries. They are quite large, being nearly two inches in diameter. The shrub is from six to eight feet high, and grows abundantly in the shaded woods that flank the mountains of Tennessee, North Carolina and Georgia. The leaves grow in pairs upon the stem, each being directly opposite the other. They are dark green and roughish on the upper surface, but quite smooth beneath, and no serration or indentation of any kind occurs along the edges. The genus Calycanthus has three species in the south-eastern part of the United States, and one in California. The three Atlantic coast ones are by some botanists considered mere varieties of a single species, so near akin are they. The widely separated stations thus occupied favor the opinion first advanced by Dr. Asa Gray, that the Eastern Atlantic and the Eastern Asiatic flora had a common origin at the time the North Frigid Zone had a temperate climate.† It was my intention to make a thorough examination of the contents of the seeds, and a determination of the percentage composition of the alkaloid for this meeting. Pressure of other duties was stronger than inclination, and the work was not done, but it is by no means abandoned. What little has been accomplished presents some points of such interest from both a chemical and pharmaceutical standpoint, that without doubt you will pardon the very imperfect character it presents.

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* Torrey Bulletin, August, 1888, p. 208.

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* Torrey Bulletin, August, 1888, p. 209.

† Brooklyn Medical Journal, Vol. II., p. 234.

In grinding the achenia the large quantity of fixed oil they contain is at once made manifest. In the powdered condition a few seconds' contact with paper saturates it. To finely powder them before abstraction of this is manifestly impossible. Rhigolin, benzin and other forms of petroleum spirit remove it completely, and they do not seem to appreciably disturb any other constituent. The barest trace of alkaloid is taken up after hours of percolation in a Soxhlet apparatus or maceration for weeks. The oil is practically the only thing removed. One hundred grams of achenia so treated weigh, after washing with the same kind of spirit and drying, only a little over sixty-one grams, and the extracted oil after evaporation nearly thirty-nine grams. In reporting my first work an error in per cent of oil crept in, by which only one-half the actual quantity found was given. The latest work made a slight gain upon the first, because much larger quantities were used. More than one-third the total weight is oil. If the alkaloid was absent, what excellent fattening food they would make, especially as most of the remaining sixty-one parts is starch and albumen. It is really not to be wondered at that animals want to eat them after getting used to the bitter taste. No drug with which your essayist is familiar ferments as readily in the presence of water as do these seeds. Licorice root does not approach it in this respect. Possibly this may account in some measure for the observed physiological effects upon ruminants.

If the alkaloid is, as Dr. Sparks suggests, analogous to strychnine, it certainly has nothing like its potency in affecting man. Twenty achenia weighing two and seven-tenths grams were freed from their pericarps and eaten without toxic symptoms of any kind. The lot from which they were taken showed the presence of two and one-fourth per cent., of alkaloid. The antipyretic effects have not yet been investigated, as lack of time forbade the isolation of sufficient of the alkaloid for the purpose. The seeds have been used by several healthy persons and observed results noted. One reported an aphrodisiac effect following during successive administrations, and another after being spoken to upon this phase believed he observed the same. The first dose usually retards digestion, but subsequent ones seemed to improve the appetite.

The alkaloid is slightly soluble in water and very soluble in ether or chloroform. Its salts are insoluble in the latter substances, but very soluble in water. Its most characteristic color reaction is the development of a green on the addition of strong nitric acid. The purer the alkaloid the finer the color. Other reactions are yellow with strong sulphuric acid, a pale canary with strong muriatic, which gradually changes toward orange, a rose-red with bichromate of potassium and strong sulphuric acid, and a pink-red if sugar is used instead of bichromate.

The ether extract of calycanthus, after all the oil has been removed with petroleum spirits, contains but little more than alkaloid and coloring matter, and yet it leaves some of these behind. Alcohol takes up what is left. Dilute mineral acid when agitated with either extract washes out the active principle, leaving barely a trace behind. The ether becomes milky on the addition of the acid, but soon clears up on shaking. Aqua ammoniæ or solution of soda precipitates the alkaloid from the acid solution again, and on washing this with ether we have it in a pretty pure state. Spontaneous evaporation of the ether leaves the alkaloid in crystals upon the capsule. Procured in the manner here indicated, it has only the faintest suggestion of the odor of pyridine. If first taken from the powdered seeds by aid of alcohol, this evaporated, dilute sulphuric acid added, made alkaline with ammonia and washed out with ether, the pyridine odor is very decided and persistent. This seems to indicate that the pyridine is a product of chemical decomposition of the alkaloid, and hence opens up one of the most interesting, if not the most interesting question in the whole range of organic chemistry. The opinion has been steadily gaining ground that pyridine is the core or nucleus of the structure of all alkaloids; and, if we have here but one or two steps to take, chemically, to reach it, calycanthine, this new alkaloid, becomes the key to unlock the grandest and most interesting secrets in the whole range of pharmaceutical science. When Wright, Menke and Luff showed that the crystallizable alkaloids of aconite were salts either of benzoic acid or one of its derivatives, they opened the gate and gave us a view of the path to follow in studying these bodies. Finding out how to saponify the alkaloids by aid of either acids or alkalies, we discovered how, as it were, to take the bricks apart of which they are built. Prof. Prescott, in a note in his most excellent work on "Organic Analysis," p. 17, says: "It is a noteworthy correspondence that three active alkaloidal agencies of intense physiological power in extensive medicinal use at present, aconitine, atropine and cocaine, agree in being saponifiable alkaloids, easily giving up either benzoic acid or some near derivative of benzoic acid (atropine, Kraut, 1865; cocaine, Lossen, 1865; aconitine, Wright, 1877). Among other saponifiable alkaloids yielding acids of the aromatic group, are piperine and certain veratrum alkaloids."

When 10 per cent. hydrochloric acid is used to remove calycanthine from ether in which it has been extracted and allowed to stand a few days, it suffers some slight decomposition, forming a brown solution. The alkaloid in this solution is very readily saponified by caustic potash and heat. The new alkaloid formed has not yet been named, although isolated in handsome crystals. The change is remarkable in that it develops a strong sweet odor like that of oil of ylang-ylang. Remember, calycanthus seeds contain no essential oil, while the flowers, bark, and leaves do. This odor is entirely the result of the chemical decomposition which changes calycanthine into a totally different alkaloid, having markedly different properties and of smaller atomic weight. The structure of this oil awaits investigation, as does that of a dense precipitate that goes down with the newly formed alkaloid on the application of the caustic soda. The quantity of the aromatic product must be considerable, as that from a fraction of a grain of alkaloid lingers for days. The suggestive interrogations that crowd in here are of the most interesting character, and make one wish that he had all his time for at least a year free from other cares, and able to devote the same to the solution of the problems here involved. It certainly seems as if there must be some connection that can be synthetically bridged between benzoic acid and our most fragrant and costly essential oils, and that the way is here indicated. Cannot some of our chemists who have more time to spare than the writer, take the matter up and give it a thorough investigation? From a commercial standpoint it is my belief that there is money in it. The abundance of the shrub in its native habitat guarantees an almost limitless supply. The essential oil of leaves, flowers and bark, would be well worth isolating as a rich ether for soda water flavoring. The fixed oil constitutes more than one-third the total weight of the seed, and is, when unaffected by high temperature, of a pleasant taste and odor. This would add materially to the income of any one who should try to utilize the shrub commercially. Although the therapeutic properties of the alkaloid have not yet been developed, little doubt can be entertained of its having some specific action upon the nerve centres that can be turned to use. Certainly the decomposition product that possesses so powerful and pleasant an odor, would be immediately utilized by perfumers, and should it prove to be identical with oil of ylang-ylang, the new supply might soon outrival the old in this our most expensive essential oil. The remaining starchy and albuminous material would make good fattening and harmless food for hogs, chickens or cattle. The ferment might prove valuable to chemists and physicians, and certainly it is active enough, if we may judge from its prompt results. Thus to pharmacists, physicians, chemists, perfumers, confectioners and farmers, it opens up interesting possibilities. The whole seed can be utilized, part in one direction and part in another. Should any single item be inadequate to support an industrial plant, surely the combination of all would be sufficient. It certainly looks worthy of further and more careful investigation, and shall receive it possibly at my hands, as a moment can be snatched now and again from the pressing cares of business; but it would be much better could many persons be induced to simultaneously take the matter up.

MR. PRESCOTT.—Do we understand that this shrub is found wherever the poisonous effects of crazy-weed are observed?

MR. ECCLES.—O, no; it is not found in the same localities. The two plants grow in different places altogether.

MR. PAINTER.—I would like to know whether this alkaloid has a toxic effect upon animals.

MR. ECCLES.—I cannot say whether the alkaloid has such effects. Much of the effect of the fruit is due to the action of the ferment, because it ferments very readily in the presence of water.

MR. PRESCOTT.—I desire to congratulate Dr. Eccles in having introduced so important a discovery as the constituents of these seeds.

MR. WHELPLEY.—It was mentioned that cattle ate the drug with considerable relish, and that it had quite a toxic effect when eaten by rats. Now, if they will eat calycanthus with the avidity that cattle seem to do, it may be that it can be placed upon the market as a rat bane, that would rival some others, and have an advantage over them.

Mr. De Forest read the following paper:

CONDENSED NOTES UPON TRIALS FOR A QUININE MASK.

BY LUTHER F. STEVENS, BROOKLYN N. Y.

Some thirty months ago, in the arrangement of work by a Committee from this Association, there was assigned to the writer a task of experimentation upon pharmaceutical possibilities in the production of a readily available vehicle for bitter medicines, and particularly to cover the taste of *Quinine.*

Infinite have been the attempts during years to reach this much desired attainment, and literature is rife with recommendations ranging through sugars and extractives from sweet roots by which to saturate the mouth lining that the bitter dose might pass unnoticed, to additions of other matters still more strong in order that an added gall should overshadow the foundation.

Who has not been required to use licorice in all its varieties, from powder mixed with dry quinine, though all the liquids and masses obtained from that most useful and complaisant vehicle, not even missing its glucoside, glycyrrhizin, which a few years ago was thought to be the acme.

Various liquid combinations have from time to time appeared upon the market, and been put to more or less use. These have largely consisted of aromatics in combination with taraxacum, prunus, licorice, eucalyptus and even the nauseous cascara. One, which was offered by the originator to the pharmaceutical profession through the medium of the New York and Brooklyn Formulary, met with great success, and from reports covering many sections of the Union would seem to have been very largely used: it is the Elixir Taraxaci Compositum, now also in the National Formulary. A notable matter of the marketable articles is that scarce any care to have used more than 2½ grs. of quinine per fluid drachm.

Manufacturers during the last few seasons have been offering combinations under title of syrup and elixir of eriodictyon, the Spanish named plant known in California as Yerba Santa (The Saint's Herb), and other local sobriquets.

The U. S. Dispensatory, 15th ed., touches upon this plant and its qualities, and notices that preparations from it had been found useful as a cover to the bitter taste of quinine.

The Association files also show pharmaceutical work upon the subject.

Mr. Chas. Mohr, (A. P. A., Proceedings 1879, page 737), in a paper presented at the Indianapolis meeting, upon "Yerba Santa," gave the result of his investigation thus:

Constituents:

A volatile oil, which would distill with steam.

An acid acrid bitter resin, soluble in ether and alcohol.

Some inert resinous matter.

Some gum, wax, tannin, etc.

All the latter, moreover, less soluble in various dilutions of spirit, and also

A *glucoside,* of decided peculiarlties, which could be obtained by extracting the herb with alcohol of 75 per cent. and freeing the percolate from resin by the addition of water.

Mr. Rother, formerly of Chicago, made many experiments (Druggists' Circular, Aug., 1886, p. 172). He percolates with an aqueous solution of borax, getting an infusion which is turned into a syrup by means of sugar. He claims for the borax that it makes the resin soluble in water, which best fits for expectorant needs.

The present writer thought it quite possible that this same bitter resin was better *out* than *in* for our purpose, because it leaves a persistent pungent effect upon the tongue, adding to the bitterness of quinine.

Mr. J. D. A. Hartz, of College Point, L. I. (Phar. Rec., March 1, 1881, p. 75), concludes that the resinous matters do not aid in the covering power, and in his process exhausts with dilute spirit (afterwards recovering the alcohol), and from the residue forms a flavored syrup. His total product is an elegant cordial, fine to smell and taste, but when mingled with quinine leaves the same peculiar pungency upon the tongue, very persistent and unpleasant, this after-taste being noticed by every one whom I ever saw try it. It would seem that he takes away too much of some things, and not all of the resins.

Mr. Cameron, of Brooklyn, presented his formula to the committee. It represents all the constituents of the fluid extract from the herb, saponified by strong alkali, aromatized and brought to a heavy syrup. It proved excellent until better was found, and is a fine syrup for general yerba purposes. But there still remains this nerve disturber when very much of quinine is mixed with it.

The Reporter, after careful study of the work from which the foregoing lines are but a sketch, became convinced that there was a field still ahead open for exploration, and proceeded with endeavors towards a ready method for retail use. In this he was assisted by friends and co-workers with suggestions innumerable, but they were also compelled to turn over to his use their tasting organs. For weeks no visitor calling at his shop, having the faintest tinge of medical or pharmaceutical experience, was allowed to depart without sampling a set of small vials to determine which tasted the *worst*. Doctors, druggists, drummers, students, or committeemen, all were impressed into the work for the good of the cause. By this means many assortments of lingual nerve centers were brought into play, and any possible future claim that but one person's taste had been satisfied, was overthrown at the beginning.

The *Yerba Santa* line was attacked first, and before long the operator felt in his inner soul that he had found the corner-stone of the future foundation.

The designating numbers, letters and figures given in this record are attached to sets of samples, duplicates being still in the laboratory, another set in the closets of the College of Pharmacy, N. Y., and also some sixty or more samples of trials, which were taken by the Committee to the Providence meeting of 1886, and shown as an earnest of the thoroughness of its work.

TRIAL NO. 1.—Elixir Taraxacum Comp.

Syrup	āā	2 fluid ounces.
Fluid Extract Yerba Santa		1 fluid drachm.
Powd. Pumice		60 grains.

Agitated, time allowed for subsidence, and decanted through cotton.

Tests.—C. Quinine mixture from 2 grs. per 60 minims.
C. C. " " " 5 grs. " "

TRIAL NO. 1½.—Same as 1 except double Yerba strength, = 1 in 16. (Either of the two finishes a muddy mixture, which however is very effectual.)

Tests.—C½. Quinine mixture, 1 gr. to 60 minims.
C. and C. C. as before.
D. Alcoholic washings from residue on cotton filter.
E. Pumice regained from the above washing.

TRIAL NO. 2.—Elixir Taraxacum Comp.

Syrup	āā	1½ fluid ounces.
Fluid Extract Yerba		1 fluid drachm.
Elixir Aromatic		1 fluid ounce.
Pumice		120 grains.

Manipulation as before.

Tests.—C., D. and E. from the same.

TRIAL NO. 3.—Elixir Tarax. Comp.

Elixir Aromatic	āā	2 fluid ounces.
Fluid Yerba		1 fluid drachm.

Manipulate as before.

Tests.—C. and D. from the same.

Trial No. 3½.—Double Yerba strength of No. 3. = 1–16.
Tests.—C. and D.

Trial No. 4.—Elixir Aromatic . . . . 2 fluid ounces.
Powd. Pumice . . . . 60 grains.
Distribute the separating powder through the liquid,
add Fluid Yerba . . . . 240 minims.
Manipulated as in No. 1., and the others, but *filtered through paper.*
Tests.—B. the syrup from this.
C. and D. as previously.

Trial No. 4¼.—
Trial No. 4½.— } Trials similar to 4 from Fluid Extract by different makers.

Trial No. 5.—Diluted Cologne Spirit (1 to 3).
(Same Alcohol strength as Elixir in No. 4).
Tests—B., C. and D. from this.

Trial No. 5¼.—
Trial No. 5½.— } Same as 5, with various trials for flavor.

Trial No. 6.—Aqua Yerba, 1 part Yerba to 24 of water.

Trial No. 6½.—Aqua Yerba, 1 part Yerba to 8 of water.
Manipulated as in No. 4.
Tests.—B., C., D. and E. from each.

Trial No. 7.—Calcined Magnesia . . . . 30 grains.
Fluid Yerba . . . . 120 minims.
Triturate, add Elixir Aromatic . . . . 2 fluid ounces.

Trial No. 8.—Carbonate of Magnesium in place of Oxide.

Trial No. 9.—Precipitated Phosphate of Calcium in place of Magnesia.
Tests.—B. only, taken from these three.

Results.—The results from these sixteen foundation trials, and the numerous testing addenda showed, that

No. 1½ best covered the taste of Sulphate of Quinine. At the first sampling before the Committee, *No.* 1 C.C. was shown, and decided to be far ahead of anything yet tried, but later when made, the *No.* 1½ proved still more effective.

Much was expected from the *No.* 4, which yielded a handsome golden Elixir, pleasant to eye and taste, but the resulting syrup had little masking power, compared with the previous numbers.

No. 5 was made to determine the taste of Yerba alone, after the same precipitation from slightly alcoholic menstruum as the rest, and without other flavor. It furnished a light amber tincture which when made into a syrup as for test B, became a nice cordial or elixir, but its covering power was slight.

The aqueous trials made as suggested, did not answer at all; too much was eliminated.

In the test samples D when examined in order, may be found in most marked concentration the pungent taste we seek to get rid of, and they vary but little through the numbered series until 6 and 7 are reached, where the wholly aqueous media allow more of the flavor to fall with the precipitate. In several of these numbers the *test* *sample E.* of washed filter shows the pumice entirely clean from the alcoholic washing, proving that little goes down there but the "A" resin.

It seems easy to draw proof from these experiments added to the published work upon the same subject, that an addition of $\frac{1}{16}$ fl. ext. of Yerba Santa minus its resin, to a dilution of elixir taraxacum comp. with an equal volume of heavy syrup, forming a thick, sweet elixir, does better for the suspension of quinine than anything yet discovered.

The day of suggestions, however, was not passed, one being thus, "That possibly coca could be used to produce its anæsthetic effect upon the nerve tips, and to aid in the disguise." A great number of trials followed upon this line, and ten are recorded, which were placed in a small case by themselves, handy to show and easy to apply to the inquisitorious.

MORE TRIALS.

TRIAL No. 101.—Syrup of Coffee.
Elixir of Coca, equal volumes.

This certainly made a fine mixture, and great was the expectation raised.

Test.—Z.	Quiniæ Sulph.	gr. x.
	No. 101	f.ʒij.

It covered fairly at first, but after a few days' standing was worse than a mixture with plain syrup.

Test.—Y.	Quiniæ Sulph.	gr. x.
	No. 101	f. ʒij.
	Elixir Tarax. Co.	f. ʒj.

This was worse at first and better later on than Z.

Test.—X.	Quiniæ Sulph.	gr. x.
	No. 101	f. ʒj¼.
	Fluid Licorice (from ext.)	f. ʒ¾.

The licorice developed the unpleasant taste of the coca to a most marked degree, and long standing increased the difficulty.

Test.—W.	Quiniæ Sulph.	gr. x.
	Fluid Licorice	f. ʒij.

The quinine is at *first* quite well disguised, but in 24 hours had developed greatly, and in four weeks the change was most disagreeble, while a great portion of the solid contents had hardened upon the inside of the bottle.

Test.—U.	Quiniæ Sulph.	gr. x.
	Vini Cocæ.	
	Syrup	āā ʒj.

At first this was very palatable, much the most so of any in the second series; it really does very nicely for single doses to be immediately taken, but a few days brings out in a highly magnified manner the unpleasant flavor which continually underlies Coca.

Not expecting to give up yet, still another combination was arranged, besides numerous incidentals and preliminaries which do not become matters of record.

TRIAL No. 102.—Elixir Taraxacum Comp.

Elixir Cocæ	āā f.℥ij.
Fluid Yerba	f. ʒiv.
Syrup	f. ℥ij.

Mix S. A. with Pumice as in the first series, decant and filter.

Test.—T. Quiniæ Sulph. . . . . gr. x.
No. 102 . . . . f. ʒ ij.

This proved no better than the rest, and it was acknowledged that Coca is worse than useless for the plan sought.

Test.—S. The original No. 1½ . . . . f. ʒ ij.
Quiniæ Sulph. . . . . gr. x.

This test sample was kept in the case with the others of the lettered series, for comparison (it is the same as 1½ C. C.).

In the latter part of August, 1886, more than two months after the work done upon this series, when running over the various samples, it was a relief to the wearied mouth to come back to this "Old Reliable."

Attention was now turned to the original trials, and further experiments in quantity undertaken to obtain the product in a more sightly form.

TRIAL NO. XX.—Fluid Yerba . . . . ʒ iv.
Magnesia, Calcined . . . . gr. x.
Pumice . . . . ʒ ij.
Elixir Tarax. Co.
Syrup . . . . āā ℥iv.

A. is the product decanted several days after the manipulation, and filtered through paper, forms a clear, thick, amber liquid, after standing a number of weeks.

F. The dregs from above were shaken with Borax, and passed through the same filter as A., which caused an immediate and thorough clearing.

D². The filter of F. washed with Alcohol for comparison, taste and appearance, quite different from D. samples.

TRIAL NO. XX½.—*Variations on above.* The Fluid Extract, Magnesia and Pumice, were rubbed with the Syrup until suspended, then the Elixir added. This remained muddy, and would neither settle nor filter clear.

F. A filtered portion was shaken with a little borax and filtered again. Muddy still.

H. A portion of the F. sample was shaken with magnesia, and allowed to stand 24 hours; it settled clear, and resembled XX–A.

TRIAL NO. XXX.—Another slight change in manipulation.
Fluid Yerba. . . . . f.ʒiv.
Magnesia, Calcined . . . . gr. x.
These rubbed up in a mortar together with pumice. . . . . ʒij.
Syrup slowly added . . . . f.℥iij.
Poured into a bottle and the mortar rinsed with syrup. . . . . . . f.℥j.
Slowly added with agitation Elix. Tarax. Co. . . f.℥iv.

Shaken well during twelve hours, allowed to subside, and decanted through cotton as before. It formed a more sightly mixture, and finally settled with a clear super liquid and muddy bottom of magnesia compounds.

D. Washings from the cotton filter.

F. Some of the filtered portion shaken with borax ʒj. per Oj. and filtered through paper.

D² alcoholic washings from the paper filter of F.

G. the cotton filter washings, by water, after the alcoholic D is finished. This has a certain amount of taste and some color, showing that the magnesia does some work, because in D washings from numbered series 2, 4, 8, the pumice filter is washed by alcohol clean and white.

Trial No XXXX.—Similar to XXX. except that one-half the syrup is replaced *by glycerin.*

The product is more sharp upon the tongue than others of this series; evidently the magnesia and glycerin dissolve more of something. At first it was thick and muddy, and never cleared by the first manipulation.

D. has more color and less resin than from any trial yet made, proving that more is left in this A. product.

E., the filter regained from D., after washing first with water and then with benzin, neither of which removed anything notable, remained dark colored, sticky, with little taste or smell; when dried was brown in color, not much taste or smell after the benzin had evaporated.

F. is a portion of A. shaken with borax as in XXX. It is sweetish from a remnant of glycerin, a light amber color by direct sunlight, fairly transparent, but tastes of the borax.

G. (aqueous washings), sweetish, dark, and of slight taste.

H. is a portion of the A. product after straining through cotton, following the shaking with magnesia and pumice, again shaken with calcined magnesia *2 gr.* per *f. ℥j*, which somewhat clears it, and after standing a long time it deposits the foreign matters. It is somewhat opaque, of a brownish shade, with the golden tint by reflected sunlight apparently common to all of these Yerba combinations.

This H. test deserves some future attention, for it contains in pleasant form, practically *all* of the constituents of Yerba in an aromatized elixir, and is still non-alkaline.

But it is too pungent to carry quinine well. D^2 not saved.

Trial No. XXXXX.—An aromatic tincture was made by taking of
materials for Elix. Tarax. Comp. . . . . gr. 256.
Tops and leaves Yerba Santa herb . . . . . ʒij.

Ground together, packed and percolated with dilute spirit, composed of alcohol 1½, water 2.

Obtaining . . . . fl. drachms 22.
And adding syrup. . . . . fl. drachms 42=f. ℥ viij.

This yielded a muddy liquid, brown and thick. Sharp to the taste.

F. some of it shaken with Borax ʒ *ij. per pint*, which after filtering cleared somewhat and darkened.

H. treated as in others under this head.

None of these formed an acceptable cover.

These latter *six* trials, with concomitants, proved several things.

First. That there is a possibility of clearing a mixture of this nature.

Second. That magnesia and alkalies, if added in the first steps of process, carry through some resins.

Third. That a second or third stage may be undertaken.

Fourth. That the prepared stock elixir and the fluid extract are more convenient and better than a fresh process.

Therefore there was brought about *the final trial*, which proved the temporary position taken at the end of the first sixteen trials. There was a total of over one hundred of these carefully-arranged trials and tests, and out of them seventy-nine are here recorded.

Aromatic Elixir of Yerba Santa.

Not entirely representing the herb, but particularly intended as a cover for quinine.

℞. Powd. Pumice . . . . ½ troy ouncce.
Syrup . . . . 8 fluid ounces.
Elixir Taraxacum Comp . . . . 8 fluid ounces.

Agitate until the fine powder is well disseminated throughout the liquid, then add with continued agitation,

Fluid Extract Yerba Santa . . . . 1 fluid ounce.

Shake occasionally during a few hours, allow it time to settle, decant carefully through absorbent cotton, adding the dregs last. To the strained product contained in a bottle, add Powd. Carbonate of Magnesium . . . . 80 grains.

Shake occasionally, let it stand over night, decant and filter through paper, adding the portion of bottom stratum last. *If necessary, use Elixir Tarax. Comp. to make 16 fluid ounces.*

The bitter resin is precipitated and remains upon the cotton filter, without injury to the other constitutents of the Yerba, and without loss of flavor from the aromatics. The after treatment with carbonate of magnesium neither adds to nor detracts from the efficiency, merely precipitating some inert vegetable extractives, and dissolving the minor resins, thus gaining in elegant appearance.

One great advantage of this preparation is that it betters with age (samples two years old are finer than when first made), and this peculiarity is carried out also in the quinine mixtures, they *improve with keeping.*

Of this product, one fluid drachm mixed by agitation with quinine sulphate 5 grains, *no acid or diluent*, will so cover the bitterness that scarcely an expert can detect it, and as for children's doses, 1, 2 or 3 grains, the tots take it like molasses.

A test was made upon a gentleman willing to stand the tug of war, of ladling upon his tongue a paste composed of *12 grains of quinine* and *60 minims of this elixir.* Although ordinarily detesting such tastes, he swallowed his dose, and said: "It is good!"

Mr. Remington.—Mr. Chairman, I had hoped that the formulas for elixirs of the National Formulary, as far as possible, should be made directly out of simples, and I think that the formulas would be more simple for the pharmacists of the country if only drugs and preparations were directed that are in the shops of every pharmacist. I noticed that Mr. Stevens uses the compound elixir of taraxacum as an addition, which is made from six or seven drugs, and I do not think that that preparation would have suffered if the compound elixir of taraxacum had been left out. You will understand that this compound elixir of eriodictyon is brought forward as being better as a disguise for the sulphate of quinine than any other preparations that have been used. But the same is claimed for compound elixir of taraxacum. I am sorry that Mr. Stevens did not make the preparation strictly out of the eriodictyon, which would have been better, provided that eriodictyon is strong enough for the purpose.

Mr. Painter.—The compound elixir of taraxacum I think is very valuable in disguising the taste of quinine. When Mr. Stevens made the experiments, he used the tincture of yerba santa, made with deodorized alcohol alone and diluted with syrup, but the best results were obtained after the addition of the taraxacum preparation, having all those ingredients.

Mr. DeForest.—The experiments are described in the paper. For instance, it is said of No. 4, containing eriodictyon and aromatics, that much was expected of it, and it yielded an elixir that was pleasant to the eye and to the taste, but that the resulting syrup had little masking power compared with the previous numbers. The previous numbers were with the elixir of taraxacum.

MR. REMINGTON.—That brings it to just about where I expected it would come—that eriodictyon alone is not to be considered in competition with the compound elixir of taraxacum, and has to be used in combination with it in order to do any good.

MR. HALLBERG.—Is this not the officinal formula?

MR. DEFOREST.—It is in the Formulary, and I have made that elixir.

MR. HALLBERG.—I have also made it, and found it satisfactory in covering the taste of quinine. It has not an agreeable taste. The combination with elixir of taraxacum covers the taste of quinine thoroughly.

MR. REMINGTON.—Now I want to know something that will cover the taste of the taraxacum elixir, and we are all right.

MR. ALEXANDER.—That might be found possibly in cocaine, by rendering the palate not susceptible to the taste.

Mr. A. B. Stevens read the following paper:

PEPPERMINT OIL.

BY A. B. STEVENS.

Much stress has been placed upon the polariscope as a test for the purity of oil of peppermint. While it is without doubt a valuable aid to the larger purchasers of the oil, its expense is such as to place it beyond the reach of the retail dealer. Again, valuable as its aid may be, even those whose moneyed means will admit the purchase of a polariscope, cannot *wholly* depend upon it as a test of purity, as the variation in different samples of pure oil is great, ranging from —35 to —55. Or oil having a high polarizing power may be largely adulterated, or it may be dementholized and still above —35°.

It is stated by A. M. Todd, "American Journal Pharmacy," that menthol has a very low polarizing power, and that an oil having a polarizing power of —74° from which 16 per cent. of menthol had been removed, showed a decrease of only 3°. The simple fact that the polarization was decreased at all, when the volume of the oil was reduced 16 per cent. proves that the polarization of the menthol must be greater than that of the oil from which it was taken.

The writer finds that both Japanese and American menthol has a polarizing power of from —95° to —100°. This was obtained by dissolving 10 grs. of menthol in 20 c.c. of alcohol (giving a volume of 31.5 c.c.), having a polariziag power of —33°. As this solution was only one-third menthol, it must necessarily be increased three fold to obtain the polarization of pure menthol, viz: —99°.

The reason of Mr. Todd's failure to obtain the true polarizing power of menthol, was doubtless due to the fact that he attempted to obtain it by reducing the menthol crystals to a liquid state by heat, instead of diluting it in a non-active liquid.

The writer would recommend the following as the most reliable test for the presence of oil of camphor in peppermint oil:

Place a drachm of nitric acid (sp. gr. 142) in a test-tube, and add one drop of the suspected oil and agitate gently, and set aside for a few minutes. The mixture will be of a yellow color, and if pure, will remain the same. If as low as 5 per cent. of oil of camphor is present, the mixture will turn red within fifteen or twenty minutes.

While experimenting with various reagents, it was found that iodine was decolorized by oil of peppermint; we then endeavored to find the limit of decolorization. Therefore a volumetric solution of iodine was prepared according to the United States Pharmacopœia, but displacing part of the water with alcohol, and proceeded as follows:

To 2 c.c. of oil was added 5 c.c. vol. solution of iodine and 10 c.c. of alcohol, agitated thoroughly and allowed to stand 10 minutes, then found the excess of iodine by titration with volumetric solution of hyposulphite of soda. By repeated experiments it was found that the reaction proceeded till nearly ten minutes had expired, but no change occurred after that time. During these experiments it was found that alcohol prevented oxidation or decolorization of the iodine. To ascertain to what extent the alcohol prevented the action, a fresh volumetric solution of iodine was prepared without alcohol, when it was found that the quantity of iodine decolorized *increased* as the quantity of alcohol was *decreased*. To complete the reaction, it required constant agitation for 10 minutes. By this method 1 c.c. of oil decolorized 30 c.c. of iodine solution.

Various mixtures of pure oil and some of the common adulterations were next subjected to a freezing mixture of —25° C. (—13 °F.), as follows:

Per cent. of Adulteration.	5%.	10%.	25%.
Alkaloid	Liquid.	Liquid.	Liquid.
Oil Pennyroyal	Solid.	Nearly solid.	"
Oil of Camphor	"	"	"
Turpentine	"	"	"

In the following table of recapitulation, Nos. 1, 2 and 3 are samples of known purity. No. 4 is a sample of No. 3, after it had been dementholized. Nos. 5 to 12 inclusive were commercial samples purchased in open market.

	Polarization.	Freezing Mixture, —25° C. (—13° F.)	Nitric acid test for oil camphor.	Vol. sol. iodine decolorized by 1 c.c. of oil.	
				With Alcohol	Without Alcohol
1. Pure Oil of Peppermint . .	—55°	Solid.	Yellow.		
2. " " . .	—44°	"	"		
3. " " . .	—38°	"	"	1.5c.c.	30c.c.
4. No. 3 Dementholized . . .	—34°	Slightly crystalline.	"	1.6c.c.	33c.c.
5. Commercial Oil of Peppermint	—30°	Semi-solid.	Red.	.85c.c.	
6. " "	—34°	Nearly solid.	Light red.	1.55c.c.	
7. " "	—25°	Cloudy.	Red.		
8. " "	—48°	Semi-solid.	Yellow.		
9. " "	—57°	Solid.	"		
10. " "	—48°	"	"		
11. " "	—25°	Cloudy.	Red.		
12. " "	—48°	"	"		
Alcohol, 2 parts; Menthol, 1 part	—33°		Yellow.	None.	0.3c.c.
Dementholized Oil, 2 p.; Menthol, 1 p.	—55°		"	1c.c.	22.1c.c.
Oil of Pennyroyal	+53°		"	0.2c.c.	9.7c.c.
Oil of Camphor, red.	+29°		Red.	0.7c.c.	
Oil of Camphor, refined	+34°		"	None.	9.1c.c.
Oil of Turpentine	+31°		Yellow.		
No. 3, 3 p.; Pennyroyal, 1 p. . .	—29°		"	1.1c.c.	24c.c.
No. 3, 3 p.; Oil of Camphor, 1 p.	—31°		Red.	1.4c.c.	23c.c.
No. 3, 3 p.; Turpentine, 1 p. . .	—32°		Yellow.	1.6c.c.	24.2c.c.

The writer is by no means content with the work done, but intends to continue it during the coming year. Mr. A. M. Todd has kindly promised a supply of oil with which to continue experiments.

The writer is indebted to Mr. H. D. Cushman for a sample of pure oil, also sample of the same dementholized. We acknowledge the indebtedness and return our hearty thanks.

Mr. Trimble read the following paper:

CATECHU AND GAMBIER.

BY HENRY TRIMBLE.

QUERY No. 27.—"The U. S. P. denotes as catechu the extract of acacia catechu; the Br. P. uses the extract of uncaria gambier. Which of the two is to be preferred?"

The extract of Acacia Catechu is known in commerce as *cutch*, and that from Uncaria Gambier as *gambier;* the former of these terms, therefore, will be used to indicate that officinal in the U. S. P., and the latter that of the Br. P. Catechu is a term applicable to either or both.

Considerable difficulty was experienced in finding gambier among the wholesale druggists, and such synonyms as "pale cutch" and "terra japonica" were tried, but either ordinary cutch was sent, or I was told they did not keep it.

It must be borne in mind that cutch is not imported primarily for use in medicine, but is brought in by hundreds of tons for the use of dyers.

Gambier comes in cubes or masses of indistinct cubes, in equal if not larger amounts than cutch, for the use of both dyers and tanners. Their prices are about the same, ranging from 5 to 8 cents per pound. All authorities agree that the medicinal use of these two remedies is for their astringent and very slight tonic properties; therefore, preference should be given to the one which possesses the greatest astringency.

A chemical examination of representative samples as found in our market, was apparently the only method of solving the problem, therefore the results of the examination of three samples of each will be given as a basis, although a number of others were partly examined in studying adulterations and searching for catechin.

No. 1. Cutch, "S. M." brand, in good repute in U. S.

No. 2. Cutch, "M. M." brand, in good repute in England, and given me by a Bradford dyer.

No. 3. Cutch, brand not known, purchased of a wholesale drug firm in Philadelphia.

No. 4. Gambier, in masses, from a wholesale drug firm of Philadelphia.

No. 5. Gambier, in cubes, dark, direct from importer.

No. 6. Gambier, in cubes, light, direct from importer.

One gram of each was powdered and extracted in a Tollens apparatus, successively with boiling stronger ether and boiling absolute alcohol. The residue was percolated with cold distilled water as long as anything dissolved. The following is a summary of results in per cent.

Sample No.	1.	2.	3.	4.	5.	6.
Soluble in stronger Ether	33.30	33.65	25.60	45.59	36.45	40.20
Soluble in Absolute Alcohol	22.08	22.63	31.78	26.80	32.28	28.25
Total by Ether and Alcohol	55.38	56.28	57.38	72.39	68.73	68.45
Soluble in Water	27.40	29.01	20.50	10.13	15.20	16.05
Total Solubility	82.78	85.29	77.88	82.52	83.93	84.50

It is usually stated in the books that the important constituents of these two drugs are catechin, soluble in ether, and catechu-tannic acid, soluble in water and alcohol, but insoluble in ether. If this be true, we would have a very ready method of determining the value of a sample; for, by simply adding those portions soluble in ether and alcohol, we would have the total available portion. That soluble in water after the above treatment, and so given in the chart, is mucilage with a part of the inorganic constituents, and forms no part of the most important pharmaceutical preparation—the tincture.

The sum by the first two solvents very closely indicates that which would be dissolved in making the tincture, but as will be shown it does not indicate the astringent value of the samples. A more accurate method for estimating the catechin, is to extract it by agitating the aqueous solution with ether. By this process the following percentages were obtained:

Sample No. 1.	2.80.	Sample No. 4.	12.64.
Sample No. 2.	1.70.	Sample No. 5.	7.76.
Sample No. 3.	10.70.	Sample No. 6.	19.76.

The aqueous residue from the agitation was warmed to expel ether, and treated in some cases with gelatin and alum, in others with gelatin and ammonium chloride, to separate tannin. The results in all cases were low and unreliable.

Portions of the original samples were then treated with "hide powder," according to the method of Simand and Weiss (Dingler's Polyt. Jour., 260, 564), and the results for tannin gotten, which, while not entirely satisfactory, are undoubtedly the best to be obtained with our present knowledge. The following are the percentages of tannin:

No. 1.	31.94.	No. 4.	33.34.
No. 2.	33.54.	No. 5.	47.18.
No. 3.	25.50.	No. 6.	45.90.

By adding to these figures the amount of catechin, we get the total available value, and by then adding the mucilage, ash and moisture, and subtracting from 100, we find the per cent. of inert constituents.

	Cutch.			Gambier.		
Samples No.	1.	2.	3.	4.	5.	6.
Catechin.	2.80	1.70	10.70	12.64	7.76	19.76
Catechu-tannic Acid.	31.94	33.54	25.50	33.34	47.18	45.90
Total Valuable Constituents .	34.74	35.24	36.20	45.98	54.94	65.66
Mucilage	27.40	29.01	20.50	10.13	15.20	16.05
Ash	2.29	2.27	2.10	4.74	3.37	3.50
Moisture	12.50	12.20	15.36	10.33	11.03	9.90
Coloring and other Inert Matter	23.07	21.28	25.84	28.82	15.46	4.89
	100.00	100.00	100.00	100.00	100.00	100.00

Dr. A. Lehmann (Dissertation Dorpat, 1880), examined a large number of samples of cutch and gambier, and found the catechin to vary from 13.8 to 33.8 per cent., and the catechu-tannic acid from 22.6 to 50.8 per cent. He was evidently able to procure better samples than the average that come to this country, although the results given in the above chart indicate the absence of intentional adulteration.

It has long been a statement in the text-books that cutch and gambier are identical in chemical composition. It has, however, never been proven, and I am convinced that it is entirely erroneous. In the above samples no crystallized catechin could be obtained from samples 1 and 2, and only a small quantity from 3, while it readily crystallized from the aqueous solution of the ethereal extract of gambier. Both the physical appearance and the analysis indicate that there are important differences in the coloring matter of the two. This is further emphasized when we consider their respective commercial uses. The tanner selects gambier for his purpose because he wishes tanning material without color; the dyer prefers cutch, because he wants coloring matter as well as tannin, the color in some cases being the more important of the two. From the published accounts of the methods of preparing these two drugs, it is impossible to believe they could be chemically identical.

Apart from their different botanical origin, the long continued heating necessary to extract cutch from the hard heart wood, is so different from that required to exhaust the more porous twigs and leaves of the gambier, that the evaporation in the case of the cutch is carried directly to dryness, the decomposition products being such as to prevent the "setting" of the mass as it does in the case of the gambier.

In the latter the concentration of the liquor is stopped when it reaches the consistency of syrup, and the liquid by stirring and cooling "sets" on account of separation of catechin, becoming of such solidity that it can be cut into blocks, and further, dried at such a low temperature that comparatively little change takes place. When gambier comes in cubes it precludes a kind of adulteration which is extensively carried on with cutch, namely, the admixture of small stones, pieces of earthenware and bricks.

Such adulteration is liable to be overlooked in selecting samples for analysis, and is best indicated when a large lot is powdered and portions of this analyzed.

Two samples of powdered cutch were examined and yielded 14.01 and 18.20 per cent. of ash, which was made up of sand and crushed stones. These samples had been further reduced in value by the heat necessary to dry them previous to powdering, as is indicated by the following percentage results obtained by treatment with ether and alcohol:

Samples No.	7.	8.
Soluble in ether	0.90	8.75
Soluble in absolute alcohol	9.93	17.50
Total valuable constituents	10.83	26.25
Mucilage, etc	47.30	29.10
Ash	14.01	18.20
Moisture	14.10	7.30
Insoluble	13.76	19.15
	100.00	100.00

Gambier in cubes could not be so adulterated, and it is so dry as to be readily powdered in a mortar without previous heating to expel moisture. It is stated that gambier is adulterated by the addition of clay, but this admixture is probably not more common than it is with cutch; in both it may be detected by the amount of residue left on burning.

Another important point is to be observed in regard to cutch; there are on the market for the use of dyers, several preparations under the name of "patent cutch," "purified cutch," etc., made by dissolving the commercial article in warm water, evaporating this aqueous solution, and adding some mordant, often potassium bichromate, to develop the color for the dyer.

These preparations are liable to creep into the drug market, and if used in medicine do much harm. Such accidents would be impossible if cube gambier alone were used. British writers are singularly reticent about their reasons for preferring gambier, but it is probably in view of facts similar to those above given. The Edinburgh Pharmacopœia, about 1840, was the first to give the option of using the extract of Uncaria Gambier, as well as that of Acacia Catechu. When in 1864, the three British Pharmacopœias were incorporated under one name, both were retained under the distinct titles of "Catechu Pallidum," and "Catechu Nigrum," but in 1874 the latter was abandoned. The only English criticism I have been able to find on this change is by Mr. Peter Squire (Companion to British Pharmacopœia, 10th edition, page 85), who states that the black is the one adopted by other Pharmacopœias, and is preferred in the arts and manufactures. It is well-known "to be by far superior to the pale in astringency, and always to be had of good quality; it is therefore a matter of surprise and regret that it has been rejected from the British Pharmacopœia."

Notwithstanding this adverse opinion, which appears to be only an opinion, if the committee on revision of the U. S. P. will make the change to gambier in cubes, and include in addition to the requirements of the Br. P., that it shall not yield over 5 per cent. of ash, I believe it would be preferable for the following reasons:

1. Gambier has more available astringency.
2. If in cubes it cannot be so easily adulterated.
3. Being more carefully dried it is more easily powdered than cutch, and without the further application of heat.
4. The cubes are more uniform in composition, and are not liable to contain mordants added for the use of dyers.

MR. OLDBERG.—I am impressed with the belief that the value of these drugs depends upon the tannic acid, which acid is formed from the catechin. Because of the treatment that the two kinds of catechu received, the black catechu which is the catechu of the United States Pharmacopœia, contains more of one and less of the other. Is not that so, Mr. Trimble? You found more catechin in the crystals from the extract of gambier than you found from the catechu?

Mr. Trimble.—I think, however, that the gambier which is now in use is altogether purer than the commercial cutch, so much purer that we might throw away the catechin in most samples of gambier, and still have a greater amount of catechu-tannic acid than in cutch. On the subject of the effect of the drug, I think that we are somewhat in darkness. The question is not whether the catechin is converted or oxidized in the stomach; but whether it has not an astringency of its own. I think it has. It has the astringency which might be likened to that of gallic acid. I think that the amount of catechin in the sample is a very good indication of its value, and that you need not throw away the catechin, and consider that the astringency only depends upon the catechu-tannic acid; you may take them both together to indicate the value of a sample.

The Chairman called upon M. Hallberg to read a paper on pharmaceutical nomenclature.

Mr. Hallberg.—I wish to make a few preliminary remarks. While this idea has been in my mind for a number of years, I have not worked at it very carefully, and this paper is offered simply as a suggestion to invite discussion and consideration of the subject. I have for years recognized the insufficiency of our nomenclature as related to pharmaceutical preparations. I believe that a great deal of difficulty to the retail druggist in making pharmacopœial preparations, and a great deal of the confusion to the physician in prescribing them, is due to the fact that we have no specific nomenclature for many preparations. If there was some way by which we could combine the description with the definition in the nomenclature, I think we would reach a good point.

NOMENCLATURE OF PHARMACEUTICAL PREPARATIONS.

BY C. S. HALLBERG.

While all sciences at this day have their specific nomenclature, pharmacy, it may be said, has no terminology to accurately define that large class of products termed pharmaceutical preparations. Though the nomenclature of the various classes is good enough as far as it goes, we believe that a nomenclature should not only define the class, but also indicate the relation the various members of the class bear to each other. That this is the correct principle is evident from the fact that the terminology of botany and chemistry have both been constructed upon this general plan—to each species of a genus a specific name, to each new chemical compound a description of its character being added.

It may be said that these branches of learning are the sciences which constitute pharmacy—a conglomerate of both—and that the latter from its miscellaneous and frequently indefinite character precludes the application of a strictly scientific nomenclature. On the other hand, the desirability of a system by which the strength of different preparations of the same class could be indicated—incorporated in its very name—would never be questioned. In fact the idea has received practical application—in the incorporation in the last United States Pharmacopœia—of the term abstracts, which not only define the class of preparations but also indicate their strength as related to the drug.

The term "Fluid Extract," while also indicating the drug-strength, cannot however be regarded in the same light, from the fact that the term was adopted simply to distinguish the fluid extract from the solid extract, and eventually to indicate the strength by common usage, and finally by official sanction in the United States Pharmacopœia, 1870.

With the preparations made by extraction, Tinctures, Fluid Extracts, Abstracts and Extracts, a plan by which their strength as related to the drug would be indicated by their name, it is believed would not only be a great convenience to the pharmacist, but of incalculable value to the physician in facilitating prescribing. The terms Tincture and Extract probably date back as far as the time of Paracelsus, and to change these may be a difficult task and perhaps utterly impracticable; nevertheless we have worked out a plan which would effect no very radical change, and it is offered for consideration, if not for approval or adoption. Commencing with the term Tinctures, we retain the last syllable—*ture*, as descriptive of a liquid preparation of a drug, replacing the first syllable *Tinc* with the abbreviation of the Latin numeral according to its drug strength. Thus by taking the drug—that is, a preparation which represents the drug weight for measure—at 100, we have:

Drug Strength by Vol.

100=Cen-ture.
50=Quin ture.
40=Qua-ture.

Drug Strength by Vol.

30=Tri-ture.
20=Vin-ture.
10=De-ture.

The intermediate numbers would be more difficult to render in euphonious terms, but the above list would probably embrace all desirable strengths. A practical difficulty would also be encountered in naming any strength below 10, as the terms given indicate rather the lower numerals of 10 than those above. This was found necessary, however, in order to obtain terms easily remembered and not too unwieldy.

By retaining the last syllable of the term Extract, viz.: *tract*—and proceeding in the same manner, we have the following terms which indicate the drug-strength in inverse proportions:

Drug Strength at 100.

100=Cen-tract.
50=Quin-tract.
40=Qua-tract.

Drug Strength at 100.

30=Tri-tract.
20=Vin-tract.
10=De-tract.

5=Quinque-tract.

These proportions agree pretty closely with the percentage yield of the various "solid" Extracts. Thus, an Extract of Nux Vomica would be a Detract, etc. In case a class of powdered Extracts should be mentioned in the United States Pharmacopœia, it would be necessary to change the construction of the terms in order to distinguish between the plastic Extract and that in powdered form. This is simply a rough outline of the plan, but it is believed that the subject is one which is well worthy of investigation. The plan proposed has the advantage of being in close accord with the metric system, and its adoption may facilitate the more general application of this system of weights and measures.

Mr. Painter—I think that this scheme should be referred to the Committee on the Revision of the Pharmacopœia, and that it should be considered at some future time, when we have thought about it and have more time to discuss the subject. It ought to be kept before us, and the Committee on the United States Pharmacopœia, it seems to me, would be the proper committee to whom it should be referred.

The question being on the motion of Mr. Painter, which was seconded, it was agreed to.

Mr. Stewart.—I do not wish to discuss the subject at all, except to say that I was very much interested in Mr. Hallberg's paper. Some time ago I wrote an article for the March number of the "Therapeutic Gazette" on a similar subject, "The Nomenclature of Pharmacy." I did not know at the time that there was an article in the London "Lancet" on valoids. It seems that a valoid is a preparation that ought to contain in each pound the full medicinal value of one pound of the drug represented, inclusive of all the alkaloids and other active principles. They are also described somewhat ambiguously as equivalent fluid or liquid extracts. In fact, the preparation is nothing but a fluid extract under another name. Of course if the same preparations can go on the market under various names there will be a serious mixing up of our nomenclature. If one manufacturing house calls the preparations fluid extracts, another house calls them valoids, and a third manufacturing house something else, then each will have its own name for the same preparation, and we would have confusion worse confounded, by having as many names for a fluid extract, for instance, as there are manufacturing houses that make the fluid extract. It seems to me our corrections in nomenclature should be of such a nature that the name would be intelligible to all, so that the nomenclature would last for years, and would be just as intelligible to the reader then as at present. A scientific nomenclature should be devised which will do away with this unfortunate tendency of multiplying names for identical preparations.

Mr. Sayre.—Dr. Stewart has apprehended the scope of this paper. But, although correct in every respect, and with all respect to Dr. Stewart, I feel that any discussion upon the points he has raised would lead us into an interminable jar. It seems to me that that particular phase of nomenclature should be discussed in another department. As for the paper itself, it seems to me it has a philosophic point which is valuable, and deserves more time than we are able to give to it this morning. I do not feel able to enter upon a discussion upon it at the present time.

Mr. Remington.—I am glad that Dr. Stewart has brought the subject up here. It presents two phases to my mind. I see a way out of a good many of the difficulties that perplex retail pharmacists. If the manufacturers of the country are going to get into a controversy amongst themselves and to call fluid extracts valoids, it will be a long time before the physicians of the country will prescribe valoids. They will still continue to prescribe fluid extracts, and that will give us all a chance. I think it is a good idea to keep up preparations which are well known, and whose strength is standardized and defined by the United States Pharmacopœia. Calling an officinal preparation by another name is certainly perplexing, and it is something which I think we ought to decidedly express ourselves as opposed to. We are aiming to elevate pharmacy, and we are going to bring pharmacy as nearly as possible to the position of the exact sciences. This matter of nomenclature is a very important step in that direction, and I do hope that we will not in any way give our sanction to the use of other names than those which have already been established for the standard classes of preparations of the Pharmacopœias.

MR. HALLBERG.—I arise to say that it is my impression that there is a difference between valoids and fluid extracts. A valoid is a preparation resembling a fluid extract, but one drachm of the valoid represents one drachm of the drug, while in the fluid extract one cubic centimetre represents one grain of the drug. The valoids have not been established in this country that I know of.

MR. REMINGTON.—I think that they are made in London. There is a slight difference in the relative strength of the two classes of preparations.

MR. OLDBERG.—I agree with Mr. Remington in that view, and there are a great many others which require mention. The suggestions are very valuable, and on theoretical grounds are exceedingly interesting. It is a gratifying fact that so many members of the Association are turning their attention to the nomenclature of the Pharmacopœia. If we look at the different groups of preparations in the Pharmacopœia at the present time, we will undoubtedly find in each group such striking dissimilarities as to call for, perhaps, some greater separation for the members of each group. Some separation at least beginning in that direction, might be made of such distinct classes as we have extracts in the five or six groups of tinctures or extracts distinctively. The suggestions of changes in nomenclature, perhaps, go further than many of us are prepared to go at the present time.

MR. HALLBERG.—A system of this kind would be desirable, and the new terms could be incorporated as secondary synonyms, if necessary, purely in an educational sense to begin with; then at some future time they might be incorporated as full officinal titles. In the paper read, I have not followed the metric system, but used the Latin numerals instead of the Greek, which should be employed in multiplication. Of course, these matters will have to be carefully considered in case anything further should be done with the suggestion.

The Chair now called for a paper on loco weed, which was read by Mr. Sayre.

LOCO WEED—THE IMPORTANCE OF SCIENTIFIC INVESTIGATION.

BY L. E. SAYRE.

At the outset I deem it expedient to offer an apology for the heading which states the subject of this paper. It was my original purpose to present to the Association a paper upon the subject of loco weed, in the usual form which characterizes literature of this nature brought before this scientific organization. Accordingly, I took up the subject for investigation in the usual way, but found, after much research, a surprising condition of affairs, which justifies me in using the above caption. The object of this paper, therefore, is not only to give the results of my researches, but at the same time to call especial attention to the importance of scientific investigation for the purpose of distinguishing between hearsay evidence and that obtained by the sifting method of modern science.

When I first went to Kansas, some three years ago, I found that loco weed had been exciting much public attention on account of its alleged poisonous effect upon cattle who pastured in the locality where it abounded. Loco weed was regarded by all as a destructive poison, damaging to the cattle interests of the West. So many complaints in fact were received concerning the immense loss to the ranchmen from this pest, that the Legislature of Colorado finally enacted laws for its suppression by means of a wholesale eradication of the plant from the soil of this State. The following is the act passed May 1, 1881:

> "Any person who shall dig up not less than three inches below the surface of the ground any loco or poison weed during the months of May, June and July, shall receive a premium of one and one-half cents per pound for each pound of such weed dug up, to be paid out of the State Treasury, as hereinafter provided: *Provided*, that such weed shall not be weighed in a green state, but shall be thoroughly dried when weighed."

There are other sections of the act referred to which relate to the claimants producing the weed, etc. The oath required to be taken by the claimant was as follows:

> "I do solemnly swear, or affirm, that the weed here produced by me this day is loco or poison weed,"

giving the number of pounds dug up within two months last past. The remainder of the act relates to weighing, recording of oath, etc.

In looking over the records, I found the following as showing the distribution of funds for this purpose during the years 1885 and 1886, which will indicate the portions of Colorado in which this pest was supposed to be the most felt:

Chaffee County	$1104	07
Costilla County	5805	89
Custer County	6156	98
El Paso County	15638	05
Fremont County	968	43
Huerfano County	9144	89
Las Animas County	8182	91
Ouray County	1384	55
Pueblo County	4176	32
Saguache County	11260	47
Making a total, for the years 1885 and 1886 only, of	$63928	56

In an interview which I had recently with the State Treasurer of Colorado, he informed me that about two hundred thousand dollars has already been expended by that State for the purpose of carrying this law into effect. It will be seen, therefore, to what enormous proportions the importance of this subject had grown in the public estimation; and as can well be imagined, when I was asked to investigate the nature of the poison, and its effect as a toxic agent, I felt that by so doing I was taking up a work which might give results of the greatest consequence to all concerned.

After an immense amount of research to ascertain the nature of the poison of loco weed, I have been gradually led away from the path first mapped out, by an unexpected turn of affairs. It is a grave question whether loco weed is a poison at all. In fact, it is a question whether the animals said to have been poisoned with it in such immense numbers as to justify the State of Colorado spending $200,000 for their salvation from the dread scourge, have not died from some other cause.

I will now give you some of my experiences in conducting this investigation: During the vacation of the University with which I am connected, in 1886, between June and September, I took the opportunity offered of visiting numerous cattle ranches in the State of Kansas. Each year since that time I have made many similar trips over a considerable territory in the West—the last summer traveling over a portion of the Indian Territory, No Man's Land, across the western portion of the State of Kansas, and a large portion of Colorado, for the purpose of visiting and collecting information from ranchmen, farmers, and others who had had practical experience with the loco weed. I at the same time had in view the mapping out of the extent of the growth of the plant, and ascertaining the amount of damage done by it to cattle, horses and sheep.

In starting out on my last trip, I arranged with Prof. Burleigh, Professor of Veterinary Science at the United States Experimental Station, at Manhattan, Kansas, that he should come to my assistance in any portion of the territory described, if I should find an animal suffering from the loco poison, the understanding being that he would make ante-mortem and post-mortem examinations, that we might report together the phenomena resulting from this poison. One of my first experiences was as follows:

Being informed by a gentleman who had large cattle interests that at his ranch, a number of miles distant, I would find an animal showing all the signs of loco poisoning, I started out for the purpose of making investigation. I travelled all day over a rough country, went through all the experiences of a tenderfoot, lost my way on the prairie, and finally came to the ranch referred to. There I partook of the sumptuous repast spread for me. After dinner we drove out to the herd: a horse was there pointed out which was said to be locoed. I am sorry I did not have with me a photographic apparatus, as I think the picture of this animal would be quite interesting. I never before saw a skeleton breathing the breath of life, as was the case in this instance. But notwithstanding the most horrid condition of the animal, there was no evidence of loco poisoning present.

It may be well here to briefly state the symptoms exhibited by an animal said to be locoed. The first symptoms are those of hallucination. When led or ridden up to some trifling obstruction, such as a bar or rope ng in the road, he stops short, and if urged forward, leaps over it as if it were a fence four feet high. All sense of distance or dimension seems to be lost. A barn near at hand seems far away, and one a mile off appears near at hand. He will go headlong against any obstruction, or over a precipice, unconscious of the proximity of the danger. He may permit one to approach him, but is likely to run away as though frightened, and then suddenly stop short, stare, and return to his former position. Any sudden and violent motion made before the animal's eyes, such as throwing up the arm, may cause him to fall to the ground through sudden fright. Sometimes the animal is seized with a frenzy, and then is uncontrollable and dangerous. The eyes during the frenzy are turned upward, exposing the whites, which are strongly injected. These seizures may be provoked by anything which excites the animal. In addition to these symptoms, the locoed animal generally loses flesh, his gait is feeble and uncertain, eyes sunken, flat and glassy, coat rough and lustreless. He will not be led, and attempts of this kind result in obstinate resistance.

One particular symptom which the ranchman mentions as indicative of a locoed condition is the loss of the sense which guides it in finding water. On the prairies water is found by native animals sooner than by man. A cow, for instance, raised upon the prairies, no matter how far away she may be, when she is thirsty, will go to the stream in the shortest and most direct way instinctively. This peculiar instinct is possessed by them to a remarkable degree, but if locoed this sense is entirely lost.

Now, during the past three years I have traveled over a large portion of the West where the loco plant is said to ravage the stock. I have visited ranch after ranch, inspecting the herds and looking for cases of poisoning; but either owing to the season of the year, or to some unexplained reason, I have been unable to satisfy myself in regard to the nature of the few cases found, either because the symptoms were so unlike those described as due to the poison, or because in the instances that came under my observation, the symptoms might be assignable to some other cause.

Time will not permit me to give you the results of the many observations I have made in conducting this investigation. It may be interesting, however, in this connection to refer briefly to an ante-mortem and post-mortem examination secured in one case where the amimal was supposed to be suffering from loco poisoning.

The case in question was that of a cow four years old. During this time she had been pasturing on grounds where this weed grows. The poison is a slow one, acting year by year during the time of pasture, so the case may be under its influence several years before the poisoning results in death. I found this animal stunted in growth, and presenting all the symptoms of mal-nutrition. She seemed stupid, as though suffering from the influence of narcotic, which, by the way, is said to be one of the symptoms of loco poisoning. Whether walking or standing, she was in constant tremor, and seemed hardly able to stand from excessive weakness. It is not necessary to detail the results of the post-mortem examination. They will be found in the "Transactions of the Kansas Academy of Science," vol. x., page 69. Suffice it to say, that the pathological condition found could be accounted for without attributing it to loco poisoning.

. I have given a full description of the loco plant, and a report of the clinical examination, in the publication above referred to and in papers which have been published in the biennial report of the Kansas State Board of Agriculture for 1885 and 1886, and in a report of the meeting of the Kansas State Pharmaceutical Association for 1888. So it is not necessary to refer to them here, especially as the plant is sufficiently described in botanical manuals. I have, however, specimens with me of three leguminous plants, each of which, in different localities, is said to be loco.

The specimen which I show here, said to be loco weed, is one I found growing on the Rocky Mountains, and differs from the astragalus mollissimus, which is commonly recognized as the loco plant. The leaves are arranged differently. The pod is hairy, but in other respects it resembles the mollissimus. This specimen is probably astragalus Bigelovii.

The genus astragalus is truly a Western genus. East of the Mississippi there are but eight species mentioned; west of the Mississippi there are about sixty-four. During the past summer it has been my object to specially study the geographical distribution of the plant. I have visited numerous sections of the country, and had interviews with cattle and ranchmen in different parts of the Indian Territory, No Man's Land, the western part of Kansas, Colorado, and New Mexico. The plant in the State of Kansas begins to appear on the southern border about Medicine Lodge, at about the ninety-ninth meridian, extending into the Indian Territory in an almost direct line south, and into the State of Kansas in rather a north-westerly direction. From this eastern boundary line it grows plentifully until the mountains of Colorado are reached, and the growth of the plant assumes a considerable importance south of the Arkansas river, extending down nearly to the southern border of New Mexico, the western boundary line being indicated by about the one hundred and ninth meridian.

In this area there are found three distinct plants of this order, having physical resemblances, which are known as loco. The most important one is the astragalus mollissimus; the second, the oxytropis Lamberti; and the third, which I have mentioned, which is probably the astragalus Bigelovii. I have had sent to me, however, numerous weeds, each claiming to be genuine loco. Among these are malvestrum coccineum, sophora sericea and amarantus albus.

It is also important to state that upon chemical examination no poisonous principle of any kind was discovered; no toxic effect was observable when administered to frogs, cats, dogs, or the human species. This does not correspond with the observation made by Dr. Isaac Ott, however. His experiments were conducted with a preparation consisting of an acidulous aqueous solution, obtained by evaporating the alcoholic tincture and exhausting the extract remaining with water acidulated with acetic acid. Dr. Ott's experiments seem to indicate toxic properties.

Feeling very certain that the specimens which I had secured possessed no poisonous properties, after testing on animals, I concluded to try some experiments on myself. Commencing cautiously with a dose of 15 minims of an alcoholic preparation, the strength of a fluid extract, which I took every three hours, I gradually increased the dose to two teaspoonfuls, and would have continued had it not been for the disagreeable effects of the alcohol. A tablespoonful of the preparation made according to the plan pursued by Dr. Ott, produced no noticeable effect except possibly that of slight stimulation, uneasy sensation in the stomach, and a slight, undefinable sensation in the head.

It will be seen, then, that in spite of all the dangerous properties ascribed to loco weed, it is probably possessed of no poisonous properties whatever. In passing, I may say, I am confirmed in this opinion by Mr. Kenedy, who has recently written from San Antonio. (Pharm. Record, July, 1888.)

The results thus far it will be observed have been negative. But, they have been none the less instructive and important. If I shall be able finally to prove beyond all peradventure that loco weed has no poisonous property whatsoever, I shall have very forcibly illustrated the point of this paper, namely, the vast importance to the public of thorough scientific investigation, which the professional pharmacist should be able to make.

The majority of mankind draw their conclusions from hearsay evidence, without investigation. Such evidence as this manifestly influenced the State Legislature of Colorado. In this case the evidence has been of such a nature that the Legislature of Colorado were evidently deceived, although it must be supposed that this body contained men of great wisdom and judgment.

Then too, observe the amount and extent of the investigation necessary to determine a point which any one not acquainted with the unreliability of hearsay evidence would naturally suppose could be settled without any difficulty whatever. Even now, after all my laborious and expensive work upon it, the point cannot be accepted as a settled one, whether loco is poisonous to cattle or not. Changes in food often seriously affect stock, as is well known, and it may be possible that cattle who have been deprived of green food, and half starved all winter, when they are turned out to luxuriant pasturage in the spring are afflicted with indigestion and the evils of mal-assimulation on account of over feeding; and this particular plant may be of such a character as to produce these symptoms in a very natural way, on account of its peculiar nature as a food, as I have pointed out in former papers. In this connection the State Veterinarian of Kansas has written a paper which was published in the *Globe Democrat*, calling attention to the subject of "Equine Dyspepsia," in which he refers to nervous phenomena which I would observe might easily be attributed among the unenlightened to poisonous food, and charged to loco.

If what I have said is true in one case, does it not point to a larger field of investigation opened to the pharmacist in connection with subjects more directly in the line of his profession? Are we not continually confronted with problems of a similar nature in relation to the properties of drugs in general?

Take the subject of new drugs as an example. The market is continually flooded with medicinal plants claiming marvelous virtues, which, if the half were only true, would cure nearly all the ills that flesh is heir to. Yet after a time many of these so-called remedies lose their prestige and disappear from the market. Yesterday I had an opportunity to see this point exemplified during a visit to the laboratory of one of the large manufacturing houses. This concern has a large room devoted to the storage of samples of medicinal plants sent them by physicians from all parts of the world, claiming virtues of great value, yet when put into the hands of their scientific department for investigation, prove to be inert.

On the other hand, we should be very careful not to accept inconclusive evidence against a new drug. I often see questions asked and answered like this: What is the medicinal value of a certain medicinal plant, and how does it compare with a certain other variety of the same plant as a therapeutic agent? Now such a question as this cannot be answered by a pharmacist. Neither can it be answered by a physician, except in active practice, and after using the drug in a large number of cases and for a number of years. Even then the question cannot be regarded as settled except the investigation has been made by a trained mind accustomed to inductive reasoning. Virchow, the great physiologist, says that not one student in twelve is capable of accurate observation, even when a point is called to his attention.

Are not we aiming in the right direction when urging the necessity of a higher education and training for the pharmacist? Are we not thus preparing ourselves in the best manner to fulfil our obligations as professional men, in the various departments of medical science in which we are called to work as physicians and pharmacists? As our field of education becomes enlarged, do not our opportunities for usefulness develop accordingly? Take the investigation of loco weed, for example: although I have not been able to prove that it possesses poisonous properties, may not the investigation be of the greatest use to science and the cause of humanity?

In conclusion, therefore, while the results of my investigations have been thus far negative and apparently fruitless, they have impressed me more than I ever before was impressed with the importance of the immense field of labor in which the scientific pharmacist is placed.

MR. SAYRE.—Tempted by the profits, a number of men began to raise loco. Furthermore, you can well see that the register of a county who has to examine the loco delivered can not tell the lupine from the astragalus, the two plants resembling each other very much. A man can cover his lot with the Astragalus mollissimus, while through the batch there may be a considerable quantity of other plants. Throughout the western part of the State there are about 64 species of astragalus, while throughout Mississippi there are not found over eight. Western astragalus is very common, with various species, and they resemble each other very much. With regard to a trip I made, you can imagine how I felt after riding all day long, and inspecting the animal, when I received the reply from the man in charge of the herd to my remark that this animal could not be locoed, "Well," said he, "I don't believe he can either." There was no use in prolonging the discussion, and I jumped into my gig and left him with thanks. One of these three specimens is Astragalus mollissimus, and I would like to ask Professor Maisch if this is not the Astragalus Bigelowii? It differs in some of the characteristics of the leaves and of the pods, the latter being very hairy.

MR. MAISCH.—I am sorry to say I am not so well acquainted with the plants of that genus as to recognize the different species at sight, but I believe that I can say that much, that this is not astragalus mollissimus.

MR. SAYRE.—The specimen I show is found growing on the Rocky Mountains commonly, and is recognized as the loco plant; but the loco plant of the lower sections of the State is different, and differs also from the Oxytropis Lamberti; and it is fair to presume that if one be poisonous the other might also be, for they belong to the same natural order.

MR. REMINGTON.—Are they found all over the State?

MR. SAYRE.—The hairy one is found at the height of 10,000 feet, while the other grows at a lower level, in sandy soil.

MR. MAISCH.—Do I understand you to say that it is not a loco weed?

MR. SAYRE.—This is the loco weed of the higher sections; but in the lower sections this other plant is so called.

MR. MAISCH.—Where these plants are found, they have the same common name?

MR. SAYRE.—Yes, sir; the different plants sent to me are of the order of leguminosæ. A gentleman asked me yesterday to send him three varieties of loco for a party abroad, who said in his letter that he wanted three, namely Astragalus mollissimus, Oxytropis Lamberti, and the Sophora. I told him so far as the Sophora was concerned, that I did not think that it could be classified as a loco weed.

MR. ECCLES.—In listening to the paper the thought was suggested to my mind that Prof. Sayre has not made such a thorough investigation of this so-called loco-weed, that we might be able to judge. The family from which it comes has, as a rule, some very positive qualities. It possesses one of the most poisonous of plants: Physostigma venenosum is not very far away from this loco, considered botanically. It occurred to me that these plants probably contain legumin, as beans and peas generally do, an albuminoid subject to decomposition. Considering that this legumin is so close in its chemical nature to casein, and considering the work done by Prof. Vaughan in his discovery of tyrotoxicon, it has occurred to me that it may, after all, be possible that the legumin contained in the pods of this plant is subject to decomposition, resulting in a substance similar to tyrotoxicon. I therefore suggest to Prof. Sayre the decomposition of the pods, and if possible the production of any ptomaïne, and see what the results are then. The ordinary method of obtaining an alkaloid will find the ptomaïne if it was produced. I think it would be a good idea to work this out.

MR. SAYRE.—In some former paper I mentioned the botanical relation between this plant and the physostigma, and so far as the decomposition products are concerned the experiments have been performed, but not with reference to the pods; for I felt that that matter was probably unnecessary, for the reason that animals are poisoned in early spring when this plant shoots out from the ground, long before the pod or even the flower appears. It is one of the first plants that gets its verdure; it seems to live all winter, springs up early with new shoots and buds, and shows the first green on the prairie. Just about that time the cattle seem to be starved and run for this plant; then is the time the trouble is mostly complained of, and again late in the fall, after the pods have shed their seeds. The seed of the Astragalus mollissimus, is very small as you will see by the specimen. So far as decomposition products are concerned I have endeavored to secure ptomaïne, but have as yet been unable to kill anything with the decomposition products; yet I shall continue to do as suggested, a very likely suggestion to the scientific mind.

MR. OLDBERG.—If I understand Professor Sayre rightly, he has not yet made up his mind as to what loco weed is, or whether loco weed is the cause of this slaughter of cattle on the ranches we hear so much of. Did I understand you to say that it is not yet settled what the loco weed is, and whether a plant causes this trouble?

MR. SAYRE.—I have stated in this and in some former papers, that the first point to determine was, whether there was such a thing as loco weed; and for that purpose I have had much correspondence. The accounts agree sufficiently upon those three astragali to regard them as the loco weeds; and they all have similar properties. Now, supposing that these particular plants produce this train of symptoms, then the point is to be determined chemically whether there is any poisonous principle in these loco plants. After finding this principle, then the cause of these particular symptoms will have to be examined. We cannot say that the whole story is a myth; I think that that would be absurd, because these men are sufficiently intelligent, and I have faith in what they say that this is the effect of certain weeds. Now, if a poisonous principle be not found, may not malnutrition be set up? I can say that the leaf of the mollissimus, when powdered, leaves about 35 per cent., if I remember rightly, of a solid substance, and probably 60 per cent. of a very light feathery, silky, hairy substance, which must be as indigestible as cotton. The thought occurred to me, could not some inflammation be set up in the alimentary tract by this light substance floating in the gastric fluid? Several theories suggest themselves, but I would not take up our time with them. A doctor of Las Vegas, who was very much interested in this subject, insisted that I would find the poison in a little worm, and that the worm was enveloped in the leaf. Well, the leaf does fold itself up in that way. The doctor and I spent a day collecting from the loco weed every insect we could find, and I sent all to the University of Kansas, where Prof. Scott, the entomologist, examined them; and he declared, as far as the insect was concerned, he could not account for the poisonous properties. Some people in Albuquerque believed that the effect was due to a bot getting into the animal's stomach, and creeping up to the brain. Now we all know that the home of the bot fly is upon the animal's hair, and we cannot dissect an animal hardly without finding lots of bots. Of course, there might be such a large number as to interfere with digestion; but the idea of attributing the poisoning to such a cause is ridiculous.

Mr. Remington.—I would like to ask whether Professor Sayre and his venerable friend gathered some of this loco plant, and by actual experiment killed a few animals with the plant? It seems to me that that would have settled the point at once. I do not mean one of the sickly kind described; but a strong, vigorous animal, fed upon these plants under certain restrictions, excluding other things.

Mr. Sayre.—The first year I went out I made arrangements with a surgeon, who had succeeded in getting a state reputation, to go with me and make a post-mortem examination. He had made an experiment on an animal in a stable, and the experiment proved successful. He consented, but when I met him in Dodge City, he said that he was very sorry that he was not able to go with me at that time, on account of important real estate transactions, but that he would give me all the appliances necessary for the post mortem examination. He gave me instruments and books which I put in my trunk. I never saw the inside of a horse before, and the books consisted of a list of the diseases of a horse, and a list of the remedies, but there was no description of bones or anything describing how I should go to work to make an examination. I did not place much confidence in the doctor's statements. But Prof. Berge, who is professor of veterinary science at an experimental station in Montana, is the man I had to employ in the later experiment. With regard to the experiment suggested, it would not prove anything in court if the animal had been fed on loco.

Mr. Remington.—I mean to give him sufficient ordinary food to keep him alive.

Mr. Sayre.—In a herd of five thousand there may be only five or ten animals affected in the way described.

Mr. Oldberg.—Has it been disproved that sophora is the loco weed in which the poison was found?

Mr. Sayre.—Only in this way, that the locoed animals were on ranches where the sophora is not found, and where the loco weed grows.

Mr. Brown.—The subject of loco is interesting. It is found in Western Kansas, but they have never heard of horses influenced or poisoned by loco. As to loco weed producing any poisonous effect among the cattle in the western country, it is a mistake. If there had been such, we would have heard more of it.

Mr. Maisch.—While I fully appreciate what Mr. Brown has said, I believe that the course mapped out by Professor Sayre is the correct one, namely, to go to the bottom of such assertions by means of a scientific investigation. When loco weed was first sent to me from different parts of the west, the specimens sent were Astragalus mollissimus, and I never knew that there was any other kind east of the Rocky Mountains. When, about ten years ago, I wrote a paper on the poisonous species of astragalus, the testimony that came to me at that time, or the assertions that were made in the letters, apparently showed that there is some connection between these weeds, which are found from Kansas to Texas, and the diseases of the cattle. The physiological experiments, as far as I have heard, I believe have all been made with carnivorous animals; now, if Professor Sayre would experiment on an herbivorous animal, that might make a considerable difference. A priori, I believe we have to conceive the possibility of a very virulent poison being present, at least in a minute quantity, in the astragalus. It has been found in a number of plants belonging to the same order, for instance in sophora, in different species of lupine, in abrus, Jamaica dogwood, and quite a number of others. The poisonous alkaloids usually, however, are present in such minute quantities that it takes a very large amount of material in order to isolate them properly. Moreover. I think several of these principles have been isolated because the bitter taste attracted attention. But they may exist in a plant, or in a part of a plant, without the taste indicating the presence of a poisonous principle. If you taste, for instance, the seed of physostigma, it will be found similar to that of an ordinary bean. It has no taste and no smell that would excite suspicion. It is similar with the Astragalus mollissimus; the taste certainly does not give an indication that anything unusual might be contained in it. Its peculiar structure, with the large amount of hairy appendages on the outside, and the toughness of the entire tissue, may, to a certain extent, account for the effects. There are, I may remark, in connection with this subject, quite a number of plants which have a similar reputation, in which poisonous principles have never been found. I might refer to the kalmia and different species of the ericaceæ. It has been positively asserted for many years that the kalmia latifolia is poisonous; also kalmia angustifolia and several allied species have been sent to me as poisonous plants from the southern states. Neither taste nor odor indicates that any of the constituents may possess unusual qualities. It has been suggested, fifty years ago, by Dr. Darlington, that the kalmia is poisonous simply on account of the indigestibility of the leaves. It may be true of this plant, and also true of other plants. It would be desirable if Professor Sayre could follow out his investigations, and that physiological experiments should be made, not on omnivorous animals, but with herbiverous animals.

The Section now adjourned until afternoon.

SECOND SESSION, WEDNESDAY AFTERNOON, SEPTEMBER 5TH.

Mr. Good occupied the chair. Secretary Whelpley read the minutes of the previous session, which were approved.

Mr. J. L. Thompson presented the following resolution:

WHEREAS, The able and interesting paper presented to the Association by Prof. L. E. Sayre, of Kansas, shows that he has made extensive investigations of the properties of the Loco weed, and that still further investigation and experiment will prove of great value to the State of Kansas and the other States in which the weed grows; therefore be it

Resolved, That the American Pharmaceutical Association recommend to the Legislatures of the aforesaid states, that they give Prof. Sayre their hearty endorsement and support for further investigation of Loco poisoning.

MR. THOMPSON.—The reason I introduced the resolution is because Professor Sayre has carried on the investigation at his own expense, and I think that the endorsement of this Association may act as an inducement for the Legislatures to make appropriations in order that Professor Sayre may carry out the work to a further point for the public good.

MR. ALEXANDER.—There is no difficulty about sending forth a resolution of this kind, but whether it will be acted upon by those States or not, is another question. I think that we ought at least to give Professor Sayre the benefit of our endorsement, and then if he can get some of his expenses refunded to which he has been subjected, it will be no more than justice to him.

MR. PAINTER.—I hope the Association will adopt it unanimously. There is a large amount of work to be done in this line, as is shown by the report, and the work is incomplete. If the states would make a liberal appropriation, they could make his work more complete than it would be otherwise. I hope it will be unanimously supported.

The question as to the appointment of a new Committee on the National Formulary having been referred to this Section, Mr. DeForest read the resolutions which had been acted on by the Association at the second session (see page 46).

MR. DEFOREST.—Perhaps the main question to be discussed is in reference to the time when the National Formulary should be revised. The Chairman of our Committee suggested no particular time in his report, but seemed to think it should be thought of and talked about, and that there should be a Committee appointed to collect all material that bears upon the National Formulary from the time that we issue the work until the time for the revision of it; and that when this time comes they should have the material ready for the Association to order the work to be printed, or if it is found necessary, that the Council should have authority. The first question he has presented is how often shall the work be revised, and he suggested that this will, to a large extent, depend upon the criticisms of the profession regarding the correctness of any particular edition, and upon the number and extent of changes proposed in its contents; that each separate edition or issue will have to be judged upon its own merits; and that while one may require revision in one or two years, another may be allowed to remain a number of years. I think that is the point to be borne in mind when we are talking about a revision, that there should be sufficient material accumulated and important improvements ready to be introduced. The cost of the work is so low, and the practical benefits to be derived from it are so decided, that no one would hesitate to invest in a new edition, even if an annual revision be found necessary. In talking this over in the Committee, I suggested that it would be well not to have it considered necessary to revise the work every year, and that idea seemed to meet with favor with most of the Committee members. It seems to me a work of that character is of almost as much dignity as the United States Pharmacopœia, and certainly is next to it in authority now; and as it has been prepared with great care, and no doubt all future revisions will be so prepared, it certainly should be given a certain number of years' time before it is revised. That is my individual opinion, and I believe it is shared in by some of the Committee, if not all. A revision might be made once in three years or once in two years. Several members of the Association seemed to think it better to put it two years. Therefore I would move that it be the sense of this Section that the work on the National Formulary be revised once in every two years.

MR. HALLBERG.—I second the motion.

MR. REMINGTON.—Mr. De Forest has expressed the right idea about the National Formulary. The many formulas of that book should be very thoroughly tried. The book is before the country, and to keep revising and changing formulas that have once been established, will, to a very great extent, militate against the usefulness of the book, and deter many druggists from accepting the National Formulary as their guide book. There is nothing more discouraging to a pharmacist than to have a change occur in the color, appearance or taste of the preparations, and I think it is much better to put up with little difficulties rather than to continually alter a preparation by slightly improving it and changing its character, particularly when you are starting in an endeavor to make an authority. Three years is a better time than two years, and the difference is not very great. The Committee may have the power to make it two years if they think it necessary, but three years would be better. If this Committee find any of the formulas absolutely wrong or impracticable, they should have authority to change the plates and make the necessary alterations; but for a thorough revision covering changes in many preparations, I think that once in three years is plenty of time.

MR. MAISCH.—Mr. Chairman, I fully agree with what Professor Remington has said in regard to the undesirability of frequent revisions of a work of that kind, and I believe the idea that was advanced in the argument of that Committee's report is a very able one, that some editions may absolutely require revision in a short time, while others may not require revision for quite a number of years. And it seems to me that that is the point which should be considered. It is scarcely possible for this Association now to say how soon the present work should be revised. Suppose that you say it should be revised in three years: that would necessitate the publication of another Formulary in the fall of 1890, just the very year when the Pharmacopœia of the United States of America will be revised. Now it seems to me we ought to collect all the material that can possibly be collected by the time the new Pharmacopœia of the United States will have made its appearance, and to see which of the formulas may be introduced in the new Pharmacopœia—such of course must be left out of the Formulary; and then we could be prepared almost simultaneously with the appearance of the Pharmacopœia, to issue a new edition of the Formulary. I do not think it practicable at all to state by resolution or otherwise how soon it should be revised; that should be left to the report of the committee that necessarily must have the whole matter in charge, and must collect the materials and report at some future meeting of the Association.

MR. ROGERS.—I think that we had better make haste slowly in regard to the revision. We have been for some time experimenting, and have just brought the book fairly to public notice; and now to speak of revision as a fact to be soon accomplished will tend to discredit the value of the work we now have. We not only want a set of formulas as complete and perfect as they can be, but we want to bring them into as large a use as possible, and a copy of the book to be in the hands of every retail pharmacist, also the book or a synopsis of it to be brought into the hands and used by the members of the medical profession. If we begin at once revising the new work or suggesting a revision, I think the interest will flag in the work accomplished. More than that, there is a business side to it. While the expenses will be met by the sales of each new edition, if the sales are large; yet I know from a conversation with Professor Maisch, if I am at liberty to quote him, that the wholesalers and other dealers, through whom many copies are now disposed of, would be very loth to carry any stock, if we discredit our own work by suggestions of imperfections which must be removed in the immediate future. I believe that it is too early to set any time for a revision, since the revision of the Pharmacopœia is so near at hand; not until after that. The committee should be appointed and have their work at hand, so as to issue a revised edition in a comparatively short time afterward.

MR. SIMMON.—Mr. Rogers has completely covered the point I wanted to suggest. I do not think it would be best to have a revision of the book now. It would look as if we had lost confidence in the work. When we have enough material on hand and there is an occasion for a revision, it should be done; but it should not now be mentioned, because of the business risk.

MR. DIEHL.—Mr. Chairman, I favor a thorough revision of the National Formulary once in five years, and in the meantime to give the committee authority to send out annually any corrections that may be necessary. If the formulæ should prove to be faulty, corrections could be made and sent out annually to the members of the Association, and it seems to me that that would be the best way. I do not think that we ought to have a revision inside of five years.

Mr. Hallberg.—From the beginning of the work on this National Formulary, it was the promise of the Association that it should be a National Formulary in fact. The original committee in New York and Brooklyn soon discovered that they could not, from their own knowledge, contribute all that should be incorporated in the Formulary; and by appointments made from each state association, a national standing was secured. Nevertheless, it was promised at the time that the New York committee had charge and did most of the work of compiling it and issuing it, that next year the committee should be in another representative location of this country, and the new committee could gather together whatever that locality desired to incorporate.

Now, while the Formulary is really beyond my expectations, still there are many preparations which the pharmacists of the west and even of the central states want very badly to see recognized in that way. These very articles are short lived, but while they do live they live very high, and are largely used, but they simply flicker and go out. Now if we are going to wait five years or even three years for a revision of the National Formulary, we will not be able to incorporate the very preparations which we would like to have, and which preparations constitute by far the largest proportion of the prescriptions of the average pharmacist. We have many more prescriptions in the central and western states for such proprietary articles than for the old line elixirs, syrups, tinctures, plasters, or pills, and we want satisfactory substitutes as far as possible for the various compounds, and for the patent and proprietary articles with which the market is flooded.

Again, it is not a question of corrections that can well enough be made every year, as has been suggested. But we need the addition and incorporation every year when such preparations are in the very first stage of their fashion: then is the time we want them incorporated in the National Formulary, and we do not want to wait until they have gone out of fashion and have lived their life of usefulness. That is why I say that two years would be a very minimum time for the revision of the National Formulary. I have not the slightest fear that this would tend to its instability, because everybody understood from the beginning that an annual revision was contemplated, and therefore I hope that two years will be determined upon as the time for the revision.

Mr. De Forest.—I named two years because several members seemed to think as Mr. Hallberg does, that two years was long enough to wait. My private opinion is that two years is not long enough. I feel confident that the committee taking this work in charge will find that three years or five years is none too long to do the work satisfactorily. Nor would I press the question of time, except that I feel that one year would be too short altogether, and that an annual revision would detract from the dignity of the work. I think Prof. Diehl's suggestion of five years would be a good time, since, as Prof. Maisch stated, three years would bring it at the time of the revision of the Pharmacopœia, and that is important in some respects; but you will remember that the Pharmacopœia is to be revised in 1890, and it will be two years after the committee are appointed before they complete their work, so the Formulary will have to wait another year, making it five years.

Mr. Maisch.—In a little over eighteen months from now the convention for the revision of the United States Pharmacopœia will meet, and in about twenty months from now the work of revising the Pharmacopœia will be well in hand. If you publish a new edition in two years, you publish it just when the revision of the Pharmacopœia is in hand, and if you stipulate now that it shall be published in three years, you will be publishing it probably just at the very time when the Pharmacopœia is ready to appear. It seems to me clear folly to say that the work *must* be revised every year or every two or three years. The proper position is to ascertain whether a revision is needed. I do not think from the reports of the committee that have been handed in heretofore, that very many members got the opinion that the Formulary should be revised every year; but the idea which was suggested by Mr. Hallberg, that for the next revision the central committee should be located in an entirely different section of the country, is a very important and very appropriate one. It is no more than right that that should be done. But could that committee gather and work up enough material in a short time to warrant the publication of a new edition of the Formulary in advance of the Pharmacopœia? I would not stipulate any time, but I would favor the appointment of a committee located in one of the large cities of the west; that is, have the central committee located there, and appoint the auxiliary committee in precisely the same way as it was done before, representing every state pharmaceutical association in the United States. Then let the committee go to work, collect the material and report to the Association: now here we have the manuscript for a revised edition of the Formulary, and if you are willing to publish it, we are willing to give it to you. If they find that a revision is not necessary, let us wait.

MR. PAINTER.—Mr. Chairman, this is certainly the proper plan—to appoint a committee to correct and revise the Formulary when it is needed; and this committee should hold over, as suggested, until the book has been published and the work is completed. I am very sure that no committee that we could appoint could come here next year prepared with and publish a revision of this book that will be satisfactory to that committee or to this Association.

MR. DAY.—The Illinois Pharmaceutical Association have declared in favor of adding the National Formulary to the United States Pharmacopœia as an appendix, and that I think would meet with the approval of this Association; if so, then it seems to me desirable that there should be a revision of the Formulary the same year in which the work is done for the next Pharmacopœia. From time to time as the revision of the Pharmacopœia occurs, such parts of the Formulary as have been found desirable should be made officinal and inserted in the Pharmacopœia itself.

MR. PAINTER.—Mr. Chairman, I do not think we could consider such a thing as that. This Formulary is entirely the property of the pharmacists of the American Pharmaceutical Association, and the physicians that have much to do with the Pharmacopœia would not take as an appendix to the Pharmacopœia a book like the Formulary with which they had nothing to do. The two works are entirely separate, and it could and would not be in place for us to recommend that the Formulary should be an appendix to the Pharmacopœia.

PROF. MAISCH.—If that was done, and the Formulary was added as an appendix to the Pharmacopœia, there is no man living who could now say precisely in what year the Formulary would be published: certainly not in 1890, possibly in 1891, and perhaps not until 1892.

MR. SIMMON.—I quite agree with the proposition made by Mr. Hallberg. I think that he has furnished an argument which is quite convincing why work should be done every year on the Formulary. Now let us go to work and see if there is any alteration demanded; and if there is, the committee on the Formulary can work that up and it can be issued as a supplement or appendix o the work of the Association year after year and then at the end of five years we will find out where we are and put it in the regular Formulary.

Mr. Remington.—It seems to me there is a very nice way out of this difficulty. I think the aim of this Association in getting up the Formulary was expressed, in the preface of the book, to be a sort of supplement to the Pharmacopœia. I think that the proper time for issuing the next edition is when the Pharmacopœia of 1890 comes out. Let it come out simultaneously with that volume, or as near as possible with it. I dare say some of the men who work on the Pharmacopœia will also work on the Formulary, and there will be an opportunity of knowing which of these preparations of the National Formulary are to be put into the Pharmacopœia. The Formulary will gain a great deal of additional authority from its being published simultaneously with the new edition of the new Pharmacopœia, and the minds of the pharmacists will connect the two books when they come out together. I think that it will not be three years from the time that the committee is appointed to the time of the issuing of the Pharmacopœia. I do not believe there will be any necessity for so much revision, and that you will have to wait three years for it. I am in favor of Prof. Maisch's idea, that we do not go on record positively as to the date when a new edition of the National Formulary is to come out; it would not be wise to do so, certainly not from a commercial point of view. But I would not tie the hands of the committee, nor is this the sense of the Association, I think, as may be judged from the discussion. We can wait, and I am perfectly willing to have the committee fix the time.

Mr. DeForest.—That is exactly the idea I had in mind when I made the motion to take the sense of the Association. Now I think it is pretty clearly expressed that the Association does not want an annual revision. That is my main idea, and, with the consent of the members, I will withdraw my motion, and present in place of it the motion that I read before the Association.

After some discussion, several alterations were made, and the resolution was read as follows:

Resolved, That a Committee on National Formulary be appointed at the annual meeting following the publication of a revision of the work; the said Committee to hold office, unless otherwise directed by the Association, until their successors are appointed at the annual meeting succeeding the issuing of a new edition, and to report at each meeting of the Association.

The resolution was seconded by Messrs. Painter and Hallberg, and it was explained that the committee should consist of a central committee of five, and of one representative of each state association. The motion was agreed to. Mr. De Forest read the following:

Resolved, That the Council shall have authority to make the necessary arrangements for the publication of the next revision, and to provide for its distribution and sale.

Mr. De Forest.—The idea is that if the committee have their material all in hand and ready for publication, while the Association is not in session, authority be left with Council to order whether the book shall be published before the Association meets or not. It can do no harm to give to Council this power.

Mr. Rogers.—I second the motion for the purpose of bringing it before the house, but I cannot imagine the combination of circumstances which would make it necessary to publish a revised edition in so short a time as shall elapse between one meeting of our Association and another.

Mr. Maisch.—While I think that Mr. Rogers is perfectly correct that there would be scarcely any necessity for such action by Council, I do not think that the Council would reach that decision of a hasty publication.

Mr. Painter.—I can see no objection to the resolution, Mr. Chairman. It leaves the final decision with the Council. That body really has the authority now to attend to the business of the Association when we are not in session; but this resolution provides most particularly for all emergencies that may arise in the publication of a revision of the Formulary.

The resolution was adopted.

Mr. DeForest read the last paragraph of the committee's report (see page 46), and moved, seconded by Mr. Rogers, that the suggestion of the committee "that the National Formulary is a standard only for those preparations which are not provided for by the Pharmacopœia," be adopted as the sense of the Section on Scientific Papers.

Mr. Oldberg.—While I agree entirely with the sense of the resolution offered, it seems to me that it does not very clearly state the difference between the Pharmacopœia and the National Formulary. The latter is almost exclusively a collection of formulas for compound preparations, mentioning only, in addition, the materials necessary for making these compound preparations which do not already have a place in the Pharmacopœia. I hope to see the day coming when the United States Pharmacopœia will no longer contain compound preparations, and when all such will be transferred from the Pharmacopœia to the National Formulary. This resolution alludes to the National Formulary as a stepping stone to the United States Pharmacopœia. Professor Remington also in his remarks alluded to the fact of some preparations in the National Formulary that might be promoted to the Pharmacopœia. I hope that that will never happen. I hope that the United States Pharmacopœia will become hereafter simply a collection of titles, definitions, and descriptions, with a sort of working formulas for examples. I hope we will eventually have crude drugs, chemicals, and solutions of definite chemicals and such characteristic galenical preparations like extracts, fluid extracts, and so on. I do hope we will not have a lot of ointments, pills, and other mixtures of similar description, but that the National Formulary will contain all of them. If we agree about that, then the two books will be entirely distinct, and yet at the same time it will be highly desirable that they should be revised together and that we should have them together; and then, after the distinction between them is well understood, it will not be necessary to wait for a revision of the Pharmacopœia in order to see what that book may contain, before we know what should be put in the National Formulary. At the same time, the delay in the revision of the Pharmacopœia might as well be spoken of also; if then we want to wait for the Pharmacopœia before we have another revision of the National Formulary, we will have only to wait for the list of titles, and nothing more. That, of course, is a matter that can be determined by the revision committee at one or two sittings; the revision committee to be appointed in 1890 can, within one or two months, certainly say what preparations will go in the Pharmacopœia. I have no objection at all if they admit such preparations as compound cathartic pills, though the formula does not belong there, but it belongs in the National Formulary.

Mr. De Forest.—If we ever accept the idea expressed by Prof. Oldberg, of course we would obviate the necessity of such an occasion as the present; but the probability is that we will not, possibly not for several succeeding revisions, and it may become necessary to change some of the preparations from the National Formulary to the Pharmacopœia. The idea brought up by the committee is, that there shall be only one standard, the United States Pharmacopœia, to take precedence even though the formula was originally published in the National Formulary, and was subsequently transferred to the Pharmacopœia. In such a case the authority of the National Formulary ceases with regard to that article and the United States Pharmacopœia becomes the authority.

MR. OLDBERG.—I do not think there is anything whatever in the resolution in conflict with the idea expressed by me. I do not object to the resolution. I will vote for it. I think it is a correct one; but at the same time, unless we understand what will be the character of the National Formulary as contrasted with the Pharmacopœia, we might be misled by the reading of that resolution.

MR. PAINTER.—The suggestion of Mr. Oldberg is progressive, and a long stride in progress, and we can hardly hope to reach such a revision for the next Pharmacopœia; but it will come as surely as there will be a future.

MR. REMINGTON.—I heartily agree with the sentiment expressed by Prof. Oldberg on this subject. I believe that we should, in the Pharmacopœia, get rid entirely of all compound preparations, balsams, and remnants of the old polypharmacal days. I think we ought to weed them out. I am perfectly prepared for that step, and have been in favor of it for a long time; but at the same time we cannot legislate for what we want to see in the future; we have to legislate for what we have now. I am very glad to have the opportunity of saying that I agree with Prof. Oldberg thoroughly in regard to that subject, but I do not think it would be wise to act upon it now, and I do not see how we can until the initial step has been taken by the Pharmacopœia.

MR. OLDBERG.—I do not propose any action at this time, for I think it would be unwise; but I believe that action ought to be taken at the next Convention for the revision of the Pharmacopœia. That is for the Association to determine, however. I am sure that we are quite ready for such a step even at the next revision, and the sooner we express ourselves on the subject, the sooner we turn it over in our minds and say whether it is practical or not, the better it will be.

MR. HALLBERG.—I am heartily in accord with this idea, and I think that such simple preparations like tinctures, etc., should be incorporated, if possible, in the next revision.

The question was then called for on the motion of Mr. DeForest, and it was agreed to.

MR. MAISCH.—I do not think that we ought to let the subject drop here; we should take steps for the appointment of a new committee. The old committee is still in existence, and this Section has no authority, as I take it, to discharge it; nor, perhaps, has it any authority to appoint a new committee; but it has authority to at least suggest at what place the central committee should be located hereafter, and I think an expression in that direction would probably have considerable weight in the Association, and go far to avoid a subsequent discussion.

THE CHAIRMAN.—Allow me to ask what further duties that present committee have to assume.

MR. MAISCH.—I know of none; perhaps, though the Association has not said so, they are discharged, with the thanks of the Association, by the presentation of their report stating that the Formulary has been printed. However, steps should be taken towards the appointment and location of a new committee.

Mr. Remington.—I move, Mr. Chairman, that this Section ask the President of the Association to appoint five members from the central part of the United States to act as a Committee for the Revision of the National Formulary.

The motion was seconded. Messrs. Maisch, Diehl, De Forest, and Oldberg spoke in favor of recommending the appointment of the Central Committee from one city. Messrs. Remington, Hallberg, and Sander, did not consider this as necessary now as it had been in the first instance. The resolution offered by Mr. Remington was then adopted.

Mr. Simmon.—The National Formulary will be of invaluable use to druggists, except in one respect, and that is it has thus far only been recognized by this Association and a number of state pharmaceutical associations; but it should also have such recognition from the medical associations of this country, and especially from the American Medical Association. It should be recognized by them and adopted as an authority for the preparations designated therein. We would then be able to draw others to us and contend with the manufacturers of pharmaceutical preparations, who are loading up the druggists' shelves worse than ever. I think it would be well if this Association were to consider the matter of sending a committee, say this Committee on the National Formulary, to the next meeting of the American Medical Association, with the view of getting that Association to endorse the formulas for these unofficinal preparations. This step can be followed up by a request to the different state pharmaceutical and medical associations to take similar action, and the result will be that they will all adopt this Formulary as an authority upon which we can agree. In that way we would open the door for the wholesale druggists to come in. The manufacturers of these preparations themselves would have an interest to push them amongst the druggists and physicians, and the Formulary would be introduced throughout the states. Now we know a prescription from one city often looks entirely different from what it does when put up in another. I would like to submit this to the consideration of the Association. I suggested it to the Committee on Formulary. If this Association would instruct the committee to visit the American Medical Association with the view of getting that Association to endorse the National Formulary and to adopt it as an authority, then the door would be opened to the general circulation of this work among the druggists of the United States, and the physicians would be made familiar with these preparations. It will be money well invested.

Mr. De Forest.—I have given this as the sense of the motion:

Resolved, That the Committee on National Formulary meet the American Medical Association, and bring to their attention the National Formulary, and that the state associations send delegates to the different state medical associations and use their best endeavors to have the Formulary adopted.

Mr. Maisch.—As far as bringing the Formulary to the notice of the different medical associations is concerned, I would state that the chairman of the committee, Dr. Rice, and your Permanent Secretary, agreed to send a copy of the Formulary to the Secretary of the American Medical Association, and of every state medical society, likewise to the secretary of every state pharmaceutical association in the United States. If they feel any interest in this matter, it ought to come officially before each of these bodies, because a copy of the Formulary was presented to each of them.

MR. STEVENS.—I suggest as an amendment that a committee be appointed to visit the American Medical Association at their annual meeting, and that committees meet each state association. This would save extra expense. Perhaps it would do just as well to appoint some one in Chicago who is interested in the Formulary, and in a similar manner it can be done in the different states without extra expense. The committee will then appear as from the different state associations before the medical associations, and, having been recognized, they can get enough physicians to help them bring it before the association.

DR. STUART.—I think, as a member of the American Medical Association, it would be a very good idea, if practical, if you could put on that committee an equal number of physicians; then there would be no difficulty about its being brought before every medical association that you desire.

MR. REMINGTON.—Success will very largely depend upon the men you are putting on the committee. I would not limit the President to the city where the convention meets, nor would I limit him in any way in reference to who should be appointed to visit the meeting of the American Medical Association. We could depend upon the President to send the best men there, and such men as will carry influence and weight as to secure a hearing before the Association. I do not think it would be judicious to limit the President.

MR. SANDER.—Permit me one moment; a convention will meet in St. Louis on the 25th and 26th of September. As the President of the Association comes from St. Louis, I am quite confident that he will see that that large portion of the country that lies between the Rocky mountains and the Alleghenies is represented, and that the physicians of that large portion of country will learn a good deal about the Formulary. He will do every thing that he can to bring about the universal adoption of the National Formulary.

MR. SEABURY.—I heartily concur in the views which Prof. Remington has presented to the meeting, and also compliment St. Louis for having at least half a dozen gentlemen who are very well able to defend pharmacy. But we do not always meet in St. Louis; therefore I think that Prof. Remington's position is well taken, and that we should appoint men who are capable to take care of pharmacy.

MR. SIMMON.—I present the following motions:

Resolved, That the President of the American Pharmaceutical Association appoint a Committee of five to visit the American Medical Association for the purpose of submitting the National Formulary to their consideration, and to use their best endeavors to get the American Medical Association to adopt this as an authority for all unofficinal preparations contained therein.

Resolved, That the Secretary of the American Pharmaceutical Association be requested to send notice to the different State Pharmaceutical Associations, requesting them to appoint a Committee from their Association to the annual meeting of their State Medical Association, for the purpose of submitting the National Formulary for their consideration and adoption as authority for all officinal preparations contained in the same.

MR. ROGERS.—That suggests another inquiry. The object is to bring the work to the notice of the physicians. To do this a distribution of the work should be made in the shape of a pamphlet, or a smaller edition of the Formulary containing merely a synopsis of it, giving the doses, titles and the composition, without the working formularies. That could be published at a very trifling expense, and if this found its way into the American Medical Association and the different State Associations, the Formulary would in that way come to the notice of the physicians. I think it would be well to present them with twenty or twenty-five copies of the National Formulary, and a larger number of the briefer edition could be given to them. I suggest this as an idea that has occurred to me now.

After some further explanatory remarks by several members, the question was called for, and the two resolutions offered by Mr. Simmon were adopted.

Mr. Sander read the following paper:

ON MINERAL WATERS.

BY DR. ENNO SANDER, OF ST. LOUIS.

Recent events, and the constant attempts of European manufacturers to fasten upon the American public and the drug trade artificial mineral waters, under the pretense of their being real, unadulterated and unmanipulated products of nature, have impelled me to bring the question of mineral waters before our honorable Association.

Mineral waters have a decided and acknowledged therapeutical value, and are mainly and most effectively used at their sources or where the medicinal spring issues from the earth, and where change of air, freedom from business and family care, beautiful surroundings and charming associations with congenial company, operate admirably together in favor of a complete restoration of the organism to its natural health. The beneficial experience thus gained from the effects of the waters at the springs has not only produced a desire of obtaining them at a distance from the springs by those who have been benefited by their use, but has also prompted their owners to meet the demand by drawing the waters into bottles, and even barrels, and offering them as an article of commerce to the drug trade and the public.

It is agreed that the medicinal effect of mineral springs depends upon the quality and quantity of their solid ingredients, and upon the temperature at which they issue from the ground. It has been proven, also, that this content of mineral substances has been extracted by the water from the geological strata through which it has passed, by the aid of solvent gases, a more or less high temperature, and the powerful action of increased pressure in the interior of the earth. The waters, therefore, must contain all their effective ingredients, and exert their full sanitary efficiency, unimpaired, at the mouth of the springs only.

The mineral substances composing the active principles of mineral waters are mainly soluble alkaline and earthy salts, and such metallic ones as are readily soluble, but whose solubility is quickly changed by various combinations with oxygen. The ferrous and manganous compounds become, for instance, transformed by the action of the atmosphere into insoluble ferric and manganic salts, and, when in such condition, will of necessity be precipitated from their solutions; the earthy carbonates form insoluble salts, while their combination with another equivalent of carbon dioxide renders them absolutely soluble. This gas, being generated and present almost everywhere, is eagerly absorbed by water, which, flowing over or permeating through layers of earthy salts in its subterraneous passages, gives them a readily accepted opportunity for a combination with the gas and a consequent transformation into a state of solution, in which they are taken up by the water. But when the surface is reached and the water, relieved from the internal pressure, is discharged into the open air, it meets with other contingencies and influences. The omnipresent oxygen of the atmosphere effects the transformation of the metallic salts as mentioned above, while the volatile carbon dioxide embraces the first opportunity to relinquish its liquid combination, diffuses into the air, and compels the now insoluble monocarbonates to separate from the water. At Pertle Springs (a chalybeate calcic spring), in West Missouri, we may observe the water issuing crystal clear from its encasement, and only two feet below filling the grooves of a trough with the red precipitate of the hydrated oxide of iron; while in the extension of the trough the water has become turbid from the precipitation of calcium carbonate, although the trough is protected by a roof, and there is no apparent cause of disturbance. At Carlsbad, in Bohemia, the hot Sprudelwasser forms a thin coat of earthy and ferric carbonates on the sides of the tumbler while the patient is slowly emptying it, thus proving the quick and almost immediate decomposition of thermal waters. It is the contact with the air, the wonderful affinity of its oxygen for all substances, and the loss of carbon dioxide, the great protector of the integrity of chemical substances, which produce these remarkable changes in mineral waters. And the influence continues uninterruptedly, whether the waters are subsequently filled into bottles, jugs, or barrels. Dr. Geo. E. Walton, in his "Mineral Springs of the United States and Canada," page 113, says: "There is not the care used in bottling waters that should be observed, and there are but few waters that are adapted for shipment." "By the most scrutinous and infallible chemical reactions it has been determined that even with the application of the utmost care in filling, most mineral waters can not be protected against the gradual and partial decomposition of their ingredients."—"Struve's Mineralwasser-Anstalten, page 6."

Constant observations and frequent analyses of mineral springs have destroyed, to some extent, the confidence of scientists in the constancy of their composition. It has been ascertained that the quantity as well as the quality of their effective elements have undergone important changes at different times in one and the same spring. The result of such investigations, as stated above, coupled with the desire to offer to patients who live a long distance from mineral springs an opportunity to enjoy their beneficial use, prompted Dr. F. A. Struve, of Dresden, almost eighty years ago, to produce mineral waters by artificial processes.

By actual experiment he established the above-mentioned theory of the formation of mineral waters in the bowels of the earth, and ascertained that their composition will remain absolutely constant, and the decomposition of their valuable ingredients be totally prevented, if they be manufactured from the first to the last under the absolute exclusion of atmospheric air and the constant protection of carbon dioxide. Therefore, mineral waters prepared in such manner represent the natural springs as they issue from the ground, and should be preferred, by physicians who desire to benefit their patients, to the waters bottled at the springs. Especially is this the case with thermal waters, which may be made of manifold strength, and reduced with hot water to an exact imitation of the natural spring. Since they are manufactured in suitable apparatus, from which they are forced under pressure, they contain an excess of carbon dioxide, which, if so desired, may be allowed to escape by short exposure before drinking; but as it renders the waters more palatable and digestible, it has been considered a great improvement upon the natural water. Approving testimony on this point has been rendered by a number of spring owners, who have produced a "doubly carbonated water" in order to make it more salable. Most of these, however, are really artificial waters, although they may assume the title of "natural" on account of commercial advantages. For instance, the Apollinaris and Taunus-brunnen have placed between the spring and the carbonating apparatus settling vats, in which the iron becomes oxidized and precipitated, and strengthening vats, in which salt is added to the settled water, for better preservation, before it is charged in the apparatus with an excess of carbon dioxide. Secretary Folger has acknowledged these different manipulations in his opinion "in the matter of the Apollinaris water," and still has come to the conclusion that it is "an article which is produced by nature and is not the handiwork of man; that it is a natural and not an artificial water."

The result of this remarkable and unique decision has been that the importation from Germany into our country of manufactured carbonated waters as "natural" waters, has increased to the large amount of 1,564,322 gallons from January 1 to June 30 of this year—over 60,000 gallons more than during the same period of 1887. Well-informed persons in Germany assure us that the Apollinaris spring produces only about 2,000,000 bottles annually; whence do they obtain the 9,000,000 necessary to complete the yearly sale of 11,000,000 bottles, as advertised in the papers? The mystery is strictly guarded by "No Admission" at the gates of their factory, and the American people continue to be deceived as to the real nature of this water by advertisements of glowing recommendations, and the action of the government, which still persists in declaring a work of man to be a product of nature.

The laurels, and especially the profits, gained by the Apollinaris Company have instigated others to follow their example, and levy tribute upon the American people by foisting upon them their imported goods as a monopoly.

The Carlsbad water represents a remedy of unique composition, which is of great medicinal value when administered at the springs, but being a thermal water it is subject to the quick decomposition already alluded to. On this account its imitation was among the earliest attempts at the production of artificial mineral waters, and sixty years ago Drs. Struve and Soltmann administered Carlsbad water of their own manufacture, in one season, to nearly 300 patients with satisfactory results. It has been made and sold in our country for more than thirty years. This water was bottled and exported at an early date, but the exportation was for a time abandoned, perhaps for the reason that the bottled water failed to have the same effect as that drank at the springs. About 1850 the bottling was resumed, and a "Carlsbad Sprudel Salt" offered, which was said to have been obtained from the springs by evaporation, and was recommended to be added to the water in case its action should be found deficient. This salt has been manufactured in large quantities, and was accepted by the profession and the public in good faith until its deficiencies were discovered. It was of a decidedly inconstant composition, containing from 85 to 98 per cent. of Glauber salts, while the actual percentage of this salt in the solid contents of the water is only about 45. This variability became so notorious that the framers of the German Pharmacopœia indicated a distinct formula for its composition—a formula which has been also adopted by you in your National Formulary, and is also recommended by high authorities in therapeutics to the Austrian pharmacists. Of late a Carlsbad Sprudel salt has been introduced in the form of powder by the lessees of the Carlsbad springs, which in appearance and composition has such decided resemblance to the artificial product as to render it plausible that it has been manufactured after the same formula. And yet the agents of the lessees of the Carlsbad springs appear before the courts of the United States and ask for protection against the manufacture and sale of Carlsbad water and salt, under the claim that the name of Carlsbad is the property of the city of Carlsbad, the sole owner of the springs!

While we may safely leave the decision of this question to our courts of justice, we ought, nevertheless, to be watchful against the usurpations of these persons, who have already brought suit against a prominent mineral water manufacturer, although they know that he, proud of the quality of his products, has never passed his goods off as imported wares. They have also repeatedly threatened members of our Association with prosecution in case they continue to manufacture *Sal Carolinum factitium*, as adopted by you in your National Formulary, thus attacking, in their presumptious impudence, not only individuals, but the august body of the American Pharmaceutical Association itself.

MR. SANDER.—Carslbad water contains a little more than one-half drachm of salts in a pint. Carlsbad salt contains Glauber salt, common salt, carbonate and a little potassium sulphate—no other salts—in about the same proportion which is given in the Formulary or in the German Pharmacopœia. It has never been prepared by evaporating the Carlsbad spring water, because that contains only about one-half ounce in a gallon. These waters are sold in wonderfully large quantities all over Europe and America. Mr. Schultze has made this water openly, has used his own labels, and has sold the water in syphons. You can never mistake a syphon for the natural water from a spring which is put into bottles. I have manufactured Carlsbad water of several degrees of strength, and the agents warned me not to manufacture any more. In their petition to the court, they stated that Carlsbad waters had been used for a hundred years, that the city of Carlsbad had derived a revenue from it, and that they expected to make money from it; they further stated that they had paid 75,000 florins in 1877 to the City of Carlsbad, and since then 175.000 florins, that they had spent 75,000 florins more in advertising, and had sent 3,000 bottles to different hospitals, and after they had spent so much money they wanted now to make some money in the United States, and to be protected in selling a four-ounce bottle of Glauber salts for 75 cents at retail, or for $5.50 a dozen, and in selling quart bottles of the water that does not contain the requisite amount of salts according to the analysis, but always contains a less quantity. The Carlsbad Sprudel has a temperature af 162° F., and while a person is drinking it—because he cannot drink that water hastily, he drinks it slowly—the other side of his tumbler becomes coated with a film of ferric oxide. I do not know whether it is correct or not for this Association to express an opinion against the outrage intended to be committed upon the pharmacists of the whole country, but I should like this Association to contend for the right of manufacturing Carlsbad salts according to the National Formulary.

MR. HALLBERG.—I present the following resolution:

Resolved, That the American Pharmaceutical Association declare it the right and the privilege of pharmacists to prepare and sell any preparation contained in the National Formulary, under its proper title or designation.

Upon my issuing a little pamphlet descriptive of the National Formulary, this combination in New York got hold of it, and wrote me that in case I engaged in the manufacture of artificial Carlsbad salts, they should be very glad to make an example of me before the Illinois courts; and I wrote them that I should be very glad to give them the chance, and that I would go out of my way and make every arrangement as soon as possible to engage in the manufacture of Carlsbad salts, and that I would like any combination of men to say to the pharmacists of this country, that this preparation could not be sold as artificial Carlsbad salts, which has been used in Germany for the last seventy years, and upon which the American Pharmaceutical Association has virtually set the seal of its approval. Therefore, I would like to see this Association pass a resolution similar to this one, if it is in order.

MR. OLDBERG.—It does not seem possible that that can be entertained. Carlsbad salts are well known for a long time, and the same formula that is now to be found in the National Formulary is also found in several pharmacopœias for about half a century back. It was in the Pharmacopœia of Sweden, probably in the year 1847, under the name of Sal Carolinum factitium.*

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*The oldest formula for artificial Carlsbad water which we have found, was published by Klaproth (see Archiv d. Phar., xxiii., p. 330.) F. Mohr, in his Pharmacopœa Universalis, ii., p. 54 (1845), gives the formula as follows: Aqua Carolina factitia: Crystallized Glauber's salt, 191 grains; Crystallized sal soda, 127 grains; Table salt, 39 grains; dissolve in hot water, 36 ounces, and add Selters water, 36 ounces. A formula for artificial Selters water is also given.—EDITOR.

MR. SANDER.—It has been made for years with the sanction of the Prussian and German Pharmacopœias, and of the Commissions that edited the Pharmacopœias. It had been declared that since the natural Carlsbad Salt is so idefinite in its composition, it should not be sold any more in the pharmacies of Germany, and that the artificial salt, prepared according to the Pharmacopœia, should be sold instead, and it has been sold everywhere. Some manufacturers in Baltimore and Chicago had judgment taken against them, and one or two made a compromise afterwards. Since I have been notified about eighteen months ago not to manufacture any more artificial Carlsbad water, I have been making it of tenfold strength.

MR. PAINTER.—I think that the Association is prepared to vote on this resolution.

MR. SAYRE.—I for one am free to say that I do not like the wording of it. It does not seem to me that it requires a motion to make this National Formulary any more of an authority than it is now. That motion has a ring of personality about it, with all respect to those who have had the opportunity to speak in this direction. It seems to me to be a wrong position for us, and I am opposed to it.

MR. HALLBERG.—In reply to Mr. Sayre, I would say that I have no personal interest in the matter. I have not made any Carlsbad salt, but I shall go out of my way now to make it, and defy them to do their worst. I ask this Association if it is not right that we should not give our moral support at least to men who have been making artificial Carlsbad salts for many years, while the agents for Carlsbad salt want people to pay $1.00 for a 4 oz. bottle that contains some crystals of sulphate of soda, frequently not weighing more than 2 oz. and you cannot get them to take back the bottle. If a combination like that can dictate to the druggists of this country what they shall make and what they shall sell, it is an outrage, and it is the right of the American Pharmaceutical Association to say that every member of the Association has the privilege to make every preparation in the National Formulary.

MR. SAYRE.—Have we not said that in publishing this Formulary?

MR. REMINGTON.—I certainly hope that this resolution will not pass. I share the feelings of the gentlemen, but I do not think we ought to go around with a chip on our shoulders and dare anybody to knock it off, and to start into a fight the American Pharmaceutical Association. I am satisfied when the American Pharmaceutical Association is attacked it will defend itself; but to introduce a resolution of this kind when the National Formulary is going before the country, will not help it to win its way, and I think it would be a very unwise thing to do. Whilst we can privately express our feelings in sympathy with these gentlemen, I should object to the American Pharmaceutical Association putting itself on record as in favor of one side or the other.

MR. SANDER.—I did not come here for sympathy, but wished to show you what is being done. I have said that if it was correct to offer a resolution of that kind it should be done. But I feel the force of the objections of Prof. Remington, and believe that he is correct. I hope that Mr. Hallberg will withdraw the resolution.

The resolution was withdrawn, and the subject was dropped.

The chair called upon Mr. Snow to read the following paper:

PHOSPHOMOLYBDIC ACID FOR THE QUANTITATIVE ESTIMATION OF ALKALOIDS.

BY H. W. SNOW, PH. C.

Under the title of Sonnenschein's solution,* phosphomolybdic acid has been in use for some thirty years as a qualitative test for the presence of alkaloids. It has not, however, been subjected to a fair trial, as a means of estimating alkaloids, either by gravimetric or volumetric methods, although it has been briefly considered in both capacities. As long ago as 1863, F. F. Mayer considered this reagent as a means of estimating alkaloids in extracts, more particularly the narcotic extracts.† But at that time he dismissed it in favor of the reagent which has since then borne his name. Among other reasons for this dismissal, the danger of precipitating ammonia and reckoning it as alkaloid was the most prominent. In this same paper, Mayer called attention to the fact that De Vrij had, in 1853, already noted the reaction of phosphomolybdic acid with alkaloids, though Sonnenschein did not seem to be aware of this at the time when he first announced the test. In my own case, feeling the need of a means of estimating the alkaloids of jaborandi and of gelsemium in a ready manner, and owing to the fact that in the case of pilocarpine it is quite out of the question to estimate it with Mayer's reagent, I was led to attempt to verify the statements of Poehl,‡ as to the composition of the pilocarpine precipitate with phosphomolybdic acid. Christensen || has called attention to the fact that the composition of the precipitate as announced by Poehl is incorrect, and of this I will speak more fully in a subsequent portion of this paper.

Laying aside theoretical conclusions as to the percentage of alkaloid in the precipitate, I sought to determine this factor in as nearly the same manner as an estimation would be conducted in every-day practice. At that time, both in the case of pilocarpine and gelsemine, the results appeared so satisfactory that I was led to extend the work to a number of other alkaloids. Proceeding on the principle that by always using the same maker's phosphomolybdate of soda, and preparing my reagent invariably in the same manner, I would get a reagent of constant composition: I set to work to determine experimentally the weight of precipitate which would be obtained from known weights of the alkaloids, and this I did with some fourteen of the more important ones. Subsequent reflection

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* SONNENSCHEIN: *Amer. Jour. Phar.*, 1858, 550; from *London Phar. Jour.*, 1858.

† F. F. MAYER: *Amer. Jour. Phar.*, 1863, 63; from *Proc. Amer. Phar. Assoc.*

‡ *Year Book of Pharmacy*, 1881, 141.

|| *Phar. Jour. and Trans.* [*3*], XII., 400.

has led me to believe that it would have been better had I given greater attention to the composition and preparation of the reagent with which I was working. It may be that a further experience will demonstrate that the phosphomolybdate of soda, as supplied in the market, is not of constant composition, and that consequently the figures given herein may need a further revision before implicit reliance can be placed on them for quantitative purposes; but even as it is, my work is not by any means barren or devoid of value, and for this reason I determined on publishing the results just as they were obtained.

There are two things at least which have been brought out by my work, one of which is, in my estimation, of considerable importance, viz., that with a reagent which is constant in composition, the composition of the precipitate is reasonably constant in a number of the alkaloids, and in the case of some of them, as pilocarpine and atropine, it is remarkably constant. The second fact brought out might perhaps be guessed at, without much danger of going astray, viz., that it is useless to attempt any estimates based on the theoretical composition of the precipitate, at least on the composition attributed to the phosphomolybdates at present.

Sonnenschein and Debray* give the composition of the ammonia precipitate as $(NH_4)_3PO_4.10MoO_3$; Rammelsberg* makes it $(NH_4)_3PO_4.11MoO_3$, while Reis† says that when the phosphoric acid is precipitated from its combination with soda, the precipitate has the composition $(NH_4)_3,PO_4.12MoO_3$, but when from its combination with iron, it may contain either 10 or 11 molecules of molybdic trioxide. He further adds that the composition, as stated, will never vary if the conditions are maintained the same.

THE REAGENT

used in making the following determinations was obtained by dissolving Merck's sodium phosphomolybdate in an acid liquid, containing 10 per cent. by volume of nitric acid, C.P., of about full strength, viz., 69 per cent. acid; the proportion being 5 grammes of salt in 100 c.c. of the liquid. It was, however, noticed, as the reagent was repeatedly prepared, that the sodium phosphomolybdate did not always act quite the same when treated in this way. Sometimes it would remain in solution until fully used up, but at others, after standing some little time, would throw out again a white granular sediment. It is this peculiarity which first caused me to feel doubt as to the constancy of the reagent.

THE DETERMINATIONS

were made by adding the reagent to the slightly acid (sulphuric acid about one-tenth per cent.) solution of alkaloid until in quite decided excess, and was then allowed to stand from fifteen minutes to half an hour before collecting on mutually counterpoised filter-papers. The washing was limited in amount, generally not exceeding three separate additions of wash-water. The precipitates do not bear washing very well, though there is a difference in this respect; it is not well, as a rule, to exceed three washings, or the precipitate will begin to show signs of disintegration. The dilution of the alkaloid, at time of precipitation, varied between one part in two hundred and one part in five hundred, and it was not sought to hold this dilution very constant. The drying of the precipitate was conducted at 85 to 90 degrees Centigrade.

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* Cited in Watts' Dictionary.

† *London Analyst*, 1886, 57.

RESULTS

are given in the following table; from three to five experiments were tried with each alkaloid, according as it seemed more or less desirable to use this reagent for its determination. Column 1 gives the alkaloid; column 2 the weight of the precipitate which was obtained each time, based on the amount from 0.100 gramme of alkaloid. Instead of giving maximum and minimum results, I have given full results, as this is sometimes instructing, as will be seen by comparing the figures of coniine with gelsemine; in one case, the gradation is comparatively uniform between maximum and minimum, while in the other, there is a sudden deviation. Column 3 gives the results of column 2 figured into percentages of alkaloid. In columns 4 and 5 are given the formulæ of the alkaloids, with the authority for the same, which were used in figuring theoretical percentages on the basis of $R_3PO_4.10MoO_3$ and $R_3PO_4.12MoO_3$, which percentages are stated in their respective columns. In the last two columns I have drawn, for the sake of comparison, from the experiments of A. B. Lyons,* on the weight of precipitates obtained from different alkaloids by Mayer's reagent.

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* Proc. Mich. State Phar. Ass., 1886, 167, *et seq.*, reprinted in *Amer. Jour. Phar.*, 1887 (Jan.), page 1.

Alkaloid.	Wt. of precipitate obtained from 0.100 gram alkaloid.	Figured to per cent. alkaloid.	Formula of the alkaloid.	On the authority of.	Theoretical per cent. figured on basis of K_3PO_4, $10MoO_3$.	Theoretical per cent. figured on basis of R_3PO_4, $12MoO_3$.	Data on the precipitates obtained by Mayer's Reagent according to Lyons.	
							Wt. of precipitate obtained from 0.100 gram of alkaloid.	Figured to per cent. of alkaloid.
Aconitine . . .	0.204	49.02	$C_{23}H_{23}NO_{12}$	Wright & Luff.	55.76	51.49	0.179 to 0.188	55.86 to 53.17
	0.204	49.02						
	0.205	48.78						
Atropine . . .	0.286	34.96	$C_{17}H_{23}NO_3$	Ladenburg.	36.09	32.23	0.216 to 0.245	46.29 to 40.81
	0.290							
	0.2915							
	0.292							
	0.3025	33.05						
Av.	0.292	34.24						
Berberine . . .	0.231	43.29	$C_{20}H_{17}NO_4$	Perrin & Schmidt *et al.*	39.56		0.200 ———	50.00
	0.244							
	0.247							
	0.252	36.68						
Av.	0.243	41.15						
Brucine	0.234	42.73	$C_{23}H_{26}N_2O_4$		43.50	39.33	0.190 to 0.214	52.64 to 46 73
	0.262							
	0.276							
	0.278							
	0 284	35.21						
Av.	0.267	37.45						
Cocaine	0.301	33.22	$C_{17}H_{21}NO_4$	Lossen.	37.19	33.27	0.240 to 0.270	41.67 to 37.04
	0.302							
	0.305	32.78						
Av.	0.303	33.00						
Colchicine . . .	From	From	$C_{17}H_{19}NO_5$	Hubler.	40.22			
	0 343	29.15						
	to	to						
	0.423	23.64						
Coniine.	0.382	26.17	$C_8H_{17}N$	Hoffmann.	19.88			
	0.400							
	0.431							
	0.432							
	0.443	22.57						
Av.	0.422	23.70						
Emetine	0.321	31.15	$C_{28}H_{40}N_2O_5$	Lefort & Wurtz.	48.6		0.240 to 0.256	41.67 to 39.07
	0.327							
	0.331							
	0.338							
	0.368	27.18						
Av.	0.337	29.68						
Gelsemine . . .	0.290	34.48	$C_{12}H_{14}NO_2$	Gerrard.	28.50		0.185 to 0.200	54.05 to 50.00
	0.293							
	0.294							
	0.295							
	0.307	32.58						
Av.	0.296	33.79						
Hydrastine . .	0.270	37.04	$C_{22}H_{23}NO_6$	Mahla.	43.68	39.51	0.200 to 0.210	50.00 to 47.61
	0.275							
	0.276							
	0.278							
	0 292	34.25						
Av.	0.278	35.97						
Morphine . . .	From	From	$C_{17}H_{19}NO_3$		31.93		0.190 to 0.204	52.63 to 49.02
	0.274	36.49						
	to	to						
	c.296	33.79						
Av.	0.283	35.34						
Physostigmine .	0.354	28.25	$C_{15}H_{21}N_3O_2$	Hesse.	34.95	31.1		
	0.356							
	0.358							
	0.379							
	0.382	26.17						
Av.	0.366	27.32						
Pilocarpine . .	0.367	27.24	$C_{11}H_{16}N_2O_2$	Harmack & Meyer.	28.90	25.50	0.295 to 0.340	33.89 to 29.41
	0.367	27.24						
	0.375	26.66						
	0.374	26.73						
Quinine* . . .	0.3666		$C_{20}H_{24}N_2O_2$		38.77	34.78	0.310 to 0.335	32.28 to 29.85
	0.3664							
Av.	0.3665	27.28						
Strychnine . .	0.282	35.46	$C_{21}H_{22}N_2O_2$		39 52		0.258 to 0.274	38.76 to 36 49
	0.297							
	0.304	32.89						
Av.	0.294	34.01						

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* These determinations were made by Mr. Lobb and reported by A. B. Prescott, in the Amer. Jour. Phar., 1877, 483.

GENERAL CONSIDERATIONS.

The foregoing figures do not need a great deal of comment, though a brief summary may not be out of place. It is not likely that phosphomolybdic acid will ever be so generally useful as Mayer's reagent has been found to be, though doubtless it will find a place in some of those instances where Mayer's reagent has been found unsatisfactory. The danger of precipitating ammonia and reckoning it as alkaloid must not be lost sight of, though solutions can usually be prepared ammonia-free. The tendency to reduction of the reagent is of more serious import. However, in the cases in which I have used the reagent for gravimetric purposes in solutions containing organic matter, this reduction did not appear to extend to the precipitate, but only involves the excess of reagent added. Again, phosphomolybdate of soda is and probably always will be expensive, and is not so easily prepared in a constant form for use as Mayer's reagent, and further is not so easy to keep. And all these factors are of consequence, unless it is found that the results obtained are sufficiently superior to warrant its introduction and general use, and this does not seem to be indicated. In dealing with *aconitine*, *berberine*, *emetine*, *strychnine*, and the same is true in a somewhat less degree of *hydrastine*, it is known that we can estimate them with a very fair degree of precision and ease by means of Mayer's reagent, and it is not likely that any advantage would be gained by changing to phosphomolybdic acid when the alkaloids are separate. When in the combinations, natural to the plant, as in the case of berberine and hydrastine, however, gravimetric results with the reagent would be preferable to titrations with Mayer's reagent for this reason: The equivalents of berberine and hydrastine are so far separated that very considerable variations in the proportions of alkaloid may be present, and yet not be shown by the titration.* With phosphomolybdic acid, however, they are brought more nearly together, and gravimetric estimations of total alkaloid estimated as berberine or hydrastine (though not having an absolute) would have a greater comparative value than any titration would have. *Atropine*, *cocaine*, *gelsemine*, *physostigmine*, *pilocarpine*, and to a lesser extent *coniine*, seem to offer greater encouragement, though in varying degrees, according to the means at hand for estimating them, or the immediate object of the estimation. It would be rather long and tedious to sum up the full reasons on these alkaloids, and we must in a large measure pass them by.

PILOCARPINE.

The reagent is quite delicate, and gives a faint opalescence with 5 c.c. of a solution containing only one part of alkaloid in seventy-five thousand, exceeding Mayer's reagent in this respect. Of the four determinations reported, the first two were made with a free alkaloid of French manufacture, while the second two were made with a nitrate of German manufacture, and from which the proportion of alkaloid was calculated by Harnack and Meyer's formula. From this it will be seen that the agreement is very close. The percentage given by Poehl,* viz.: 45.66 per cent. of alkaloid in the precipitate, I find by calculation is a theoretical one and is based on the formula of Kingzett† for the alkaloid ($C_{23}H_{34}N_4O_4$) and on $R_3PO_4,10MoO_3$ for the phosphomolybdate. Christensen ‡ found, using Poehl's figures, in four experiments from 106.7 to 135.6 per cent. of the alkaloid taken, and in a fifth experiment no less than 429.8 per cent. of the quantity taken, and therefore concluded that the composition of the precipitate is not constant. His results do not coincide with mine.

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* Thus in solutions containing 1 part in 200 Mayer's $\frac{n}{20}$ reagent indicates 0.0263 grams of berberine, but only 0.0101 grams of hydrastine.

GELSEMINE

is another alkaloid which promises to yield very fair results in estimations by phosphomolybdic acid. Any one who has made even a limited number of titrations of this alkaloid with Mayer's reagent will be aware that this latter reagent does not afford a satisfactory means of estimating the alkaloid, and any improvement will be welcome. This, I think, can be found in gravimetric or volumetric estimations by phosphomolybdic acid.

CONIINE. ||

With this alkaloid, the reagent gives a faint opalescence with solutions containing about one part in 5000 to one part in 6000, being in this respect considerably superior to Mayer's reagent, which shows no precipitation in solutions containing as much as one part in 2000. Notwithstanding the appearance of the precipitate in solutions of one part in 5000, the actual solubility of this precipitate in water free from the reagent is about one part in 1100, and it was experimentally proven that the solubility of the precipitate is greater in pure water than in a solution containing a slight excess of the precipitant. At the same time the precipitate is somewhat soluble in a great excess of the reagent. In the cases where I have used phosphomolybdic acid for the gravimetric estimation of coniine, I have corrected the weight of the precipitate by adding two milligrammes for every 10c.c. of filtrate and wash-water used in the estimation, this being based on the supposition that with small amounts of reagent present, the

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* Where last cited.

† Year Book of Phar., 1877, 615; from Jour. Chem. Soc., Oct. 1876.

‡ Where last cited.

|| From experiments reported by the writer in The New Idea, Feb., 1888, p. 638. [Pharm. Era, II. 217.]

solubility would be only about one part in 5000 [the noted point where the precipitation becomes apparent]. In comparing results of estimations made by the reagent with the results of estimation made by weighing the muriate (after Cripps*), I have obtained higher results by the precipitations usually running 25 or 30 per cent. more of alkaloid, though in one case about 200 per cent. more alkaloid was indicated by precipitation than was shown to be present by weighing the muriate.

With *brucine*, *colchicine*, and *morphine*, results do not thus far appear very favorable. With all three, I had been in hopes that good results might be looked for. Morphine is not precipitated in very dilute solutions and a reduction of the reagent takes place which will most likely affect the accuracy of the estimation. There seems little reason to believe that the reagent will be found of any value with any of these three alkaloids.

VOLUMETRIC.

The reagent has already been used by Zenoffsky for volumetric determinations of coniine by first making a reagent of which each cubic centimetre will precipitate 33.3 milligrammes of strychnine, and then each cubic centimetre will be found to precipitate 50 milligrammes of coniine. Doubtless similar equivalents could be determined for other alkaloids, and I am a little inclined to favor, for the time being at least, a volumetric method, where the value of the reagent has first been determined by titrations on known material; best, no doubt, titrated against the alkaloid that is expected to estimate, though there is little fear in the long run that its value cannot be determined for some common alkaloid, and applied from that to others, just as in the case of strychnine and coniine. I feel quite confident that the reagent can be used successfully in two or three instances where we are now lacking ready methods for estimation of the alkaloid. as in the case of gelsemine and pilocarpine, and in the case of the alkaloids mentioned will myself have occasion to make quantitative estimates with its aid. So long as the reagent is controlled by occasional titrations against known material, there will be little danger of going far astray. There is, however, one thing which must not be lost sight of. The observation first made by Groves,† and confirmed independently by Lyons ‡ at a later date, that in titrations with Mayer's reagent a point is reached where the filtered solution will cause a precipitate on the addition of a fresh solution of the alkaloid, or by the further addition of the reagent, showing that there is already an excess of the precipitant in the solution, is equally true of titrations of pilocarpine by phosphomolybdic acid. With this fact the degrees of dilution will be almost certain to affect the results, and will necessitate the application of a correction only to be determined experimentally, as in the case of Mayer's reagent. With these remarks I will conclude a paper which I fear has been rather tedious, and which may be objected to on account of the too frequent use of the word "probably." The subject is too extensive, however, to be exhausted in a single paper; and as the field is almost wholly unworked, I have been obliged to accept limited evidence upon some of the points dwelt upon.

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* Pharm. Jour. and Trans., 1887, 12. [Pharm. Era, I, 368.]

† Quoted by Lyons from the *Pharm. Jour. and Trans.* [2], 6, 268.

‡ Where last cited.

MR. HALLBERG.—I would like to ask Mr. Snow whether the precipitation subsides more quickly than that with Mayer's solution does.

MR. SNOW.—This varies. The precipitates of some alkaloids with Mayer's reagent will subside readily, but others do not. As a rule, these precipitates subside readily, but they will not stand a great deal of washing.

MR. HALLBERG.—I had reference to the volumetric estimation, and whether phosphomolybdic acid would have an advantage over Mayer's solution, by virtue of more quickly subsiding.

MR. SNOW.—It is on the whole better. I have been in the habit when using Mayer's reagent, of filtering the solution after agitation, and passing through a sieve, and I think there would be an advantage in that.

MR. ECCLES.—I should think it would depend upon the alkaloid and its amount, whether to use phosphomolybdic acid or Mayer's solution for precipitating, and upon the facility with which the precipitates are formed. Working with Mayer's solution, I found the precipitates of some alkaloids were very slow in subsiding, and I thought that by putting a drop or two of ether in the screen, they subsided more readily.

Mr. Trimble read the following paper:

COMPOSITION OF PRECIPITATED FERROUS SULPHATE.

BY HENRY TRIMBLE.

QUERY NO. 7.—Is the Precipitated Sulphate of Iron of Constant Composition? Does it contain the same Proportion of Water of Crystallization as the large Crystals?

As inquiry at several stores in Philadelphia revealed the fact that this officinal preparation is not usually kept in stock, I made the experiments on four samples prepared by myself. No. 1 was made according to the U. S. P. No. 2 according to the Br. P., with the quantity of water reduced to 20 per cent., and without boiling the solution. No. 3 according to the proportions of the Br. P., omitting the boiling; as this solution was quite dilute, the yield was small. No. 4 was made exactly according to the directions of the Br. P. This authority directs that the solution be boiled for 10 minutes in an open dish, but leaves one in doubt whether to take into account the loss by evaporation or not; therefore if the strength of the solution and consequently the proportion of alcohol affect the composition, it will be shown by samples 3 and 4. The directions for getting rid of adhering moisture and acid are not so exact as our own, consequently a slight excess of acid will be found in the Br. P. samples. In the following results, the amount of iron was determined by both gravimetric and volumetric methods, the latter being by titration with potassium permanganate. The results by the two methods were not materially different. The sulphuric acid was determined by barium chloride.

	No. 1. U. S. P.	No. 2. Br. P. less 20 % Water, not boiled.	No. 3. Br. P. Not boiled.	No. 4. Br. P.	No. 5. Larger Crystals.	Theoretical.
Fe. . .	20.48 %	20.86 %	20.35 %	20.37 %	20.53 %	20.12 %
SO_4 . .	35.40 "	35.84 "	35.40 "	35.44 "	36.40 "	34.54 "
H_2O . .	44.12 "	43.30 "	44.25 "	44.19 "	43.07 "	45.34 "
Total . .	100.00	100.00	100.00	100.00	100.00	100.00

No. 5 settled out from the filtrate of No. 3, which was more dilute than the others and therefore contained a larger quantity of the salt. The deposit took place during three weeks, in granular crystals much larger than in the other samples.

None of the specimens when first made gave more than slight indications of ferric iron and the determinations by potassium permanganate failed to indicate any appreciable quantity. The above results are sufficient to show that the salt precipitated under different conditions is of constant composition.

This is contrary to the results gotten by Barkhausen (Archiv der Pharmacie, Band 148, 1871), who found it to contain less than $7H_2O$, and to lose moisture rapidly on exposure to air. His results may be attributed to the method used in analysis (with calcium hypochlorite), or to overdrying the salt in its preparation.

L. Caro (Liebig's Annalen, 165, 29) contradicted these statements and found the salt to contain $7H_2O$, and to remain of the same composition after a month's exposure to the atmosphere. While I can agree with the first part of Caro's statement, which has also been verified by Tilden (Phar. Jour. and Trans., 3, 11, p. 1026), it is difficult to believe that this salt will remain unchanged for a month when exposed to the atmosphere.

To investigate this, portions of samples 1, 2, 3, and 4 were placed on filter paper loosely covered with the same, and exposed to the air in a room without artificial heat, well ventilated, with a temperature varying between 55° and 90° F. (13° and 32° C.) for a month.

As the change appeared to be on the surface the samples were well mixed and bottled. The ferrous and total iron were estimated by titration with potassium permanganate, with the following results :

	1.	2.	3.	4.
Fe. as ferrous	20.92	21.86	21.74	21.72
Total Fe.	21.12	21.86	21.74	21.92

By calculation we get the following percentages of water: No. 1, 42.45; No. 2, 40.67; No. 3, 40.94; No. 4, 40.28.

It will be seen that oxidation took place in two of the samples only, and even in them it was almost insignificant, but that there was a loss of about 4 per cent. of water, which is almost the equivalent of one molecule.

A sample which had been kept in a glass-stopped bottle for several years was also examined and found to have the composition of the officinal salt; the bottle had been frequently opened for the removal of a portion of its contents, and at the time of the examination was nearly empty.

Precipitated sulphate of iron, then, is of constant composition, and is the same as the large crystals; it keeps well in glass-stopped bottles, but loses water, and is slowly oxidized on exposure to the atmosphere.

MR. TRIMBLE.—Oxidation is so slow that it is doubtful whether the numerous suggestions that have been made for preserving it by keeping camphor in the bottle, and for keeping it in a glass stoppered bottle, are at all necessary. It changes much slower than the crystallized salt.

The chair stated that five papers had been received from students of the University of Michigan at Ann Arbor, who are not members. On motion of Mr. Bedford, these papers were received as volunteer papers.

Mr. Thompson was then called upon to read his paper on pepsin testing.

COMPARATIVE PEPSIN TESTING.

F. A. THOMPSON, PH. C.

Pepsin is a drug which is conceded to be one of the most important of our materia medica, and it is with a view of determining the true and relative value of the various makes in use that I present this paper, in as concise a form as possible, on the subject of *Comparative Pepsin Testing*.

Reviewing the tests laid down in the different Pharmacopœias and in the recent issue of the National Formulary, I find a great variance in the conditions, as can readily be seen at a glance over the schedule given below. The three pharmacopœial tests may be criticized on the point that an excess of acid is used, *i. e.*, far more than is in the gastric juice.

SCHEDULE OF VARIOUS TESTS.

Tests.	Parts of water to every part of albumen.	Per cent. Absolute HCl, by weight.	Period of digestion.	Temperature Fahrenheit (Celsius)	Treatm'nt during digestion.	Requirements for one part of pepsin.	Condition of the albumen in the test.
U. S. Pharmacopœia, '80 .	10	0.47	5 or 6 hours.	100 to 104° (38 to 40°)		Should digest at least 50 parts.	
British Pharmacopœia, '85 .	4.5	0.38	30 minutes	130° (54.4)	Well stirred.	Will dissolve 50 parts.	Albumen passed through wire gauze of 36 meshes per linear inch.
German Pharmacopœia, '82 .	15	0.40	4 to 6 hours.	104° (40°)	Often and violently shaken.	Dissolves 100 parts to an opalescent solution.	Albumen pieces the size of a lentil.
National Formulary, '88 . .	10	0 16	60 minutes	125°(51.69)	Shake well at intervals of 5 minutes.	To dissolve 2500 parts, which is ¾ the amount taken.	Albumen passed through a hair sieve 30 meshes to the linear inch.
Author's Modified U. S. P.	10	0.30	6 hours.	Constant at 104° (40°).	Constant and uniform stirring.	Shall completely digest the amount taken.	Albumen thr'gh a 30 mesh brass sieve.

It is not my intention to criticize the value of these various official tests, as they are intended only for the purpose of determining whether a pepsin is above or below the requirement of that test. But I hope to show that the usual application of any one of these tests in determining the comparative proteolytic action of various pepsins gives fallacious results.

The prevailing rule in making comparative tests of pepsin is to use the same amount of albumen, water, acid and pepsin, all being subjected to the same temperature and treatment during a like period of digestion. This apparently prescribes like conditions; but here comes in the fallacy, for the conditions so soon become unlike during the test that the comparative result is vitiated.

The usual result of such a test is that one brand has nearly or completely digested the entire amount of albumen taken, and the rest have only digested various fractions of the amount of albumen originally taken, which shows that the pepsins have a different proteolytic action, *but does not represent the true comparative action of the various digestive ferments.*

The fallacy of such a test lies in the fact that the conditions are not the same when one pepsin completely digests the total albumen subjected and the others digest only fractions of the same. For the action of pepsin being superficial, the weaker pepsins soon have more surface of albumen to act on than the stronger, and therefore show better than they should. The reasons for this reside in the fact that an increase in the proportion of the albumen to that of the pepsin *increases its digestive power* as the surface of the albumen has been increased.

I claim that the only proper way to determine the true comparative proteolytic action of pepsins *is to take sufficient of each pepsin to completely digest the same amount of albumen under exactly like conditions, or use sufficient of each to digest the same per cent of the total amount of albumen taken.* In testing pepsins, we cannot accept that there is as much ferment in one grain of one product as there is in the same amount of another, so the only correct way is to take for a basis of calculation what a pepsin of a high digestive power can do in a given time and call this for convenience 100 per cent., and then determine by comparative assays how many grains of the other makes under examination it requires to do the same amount of work or completely digest the amount of albumen taken, stating the results in per cent.

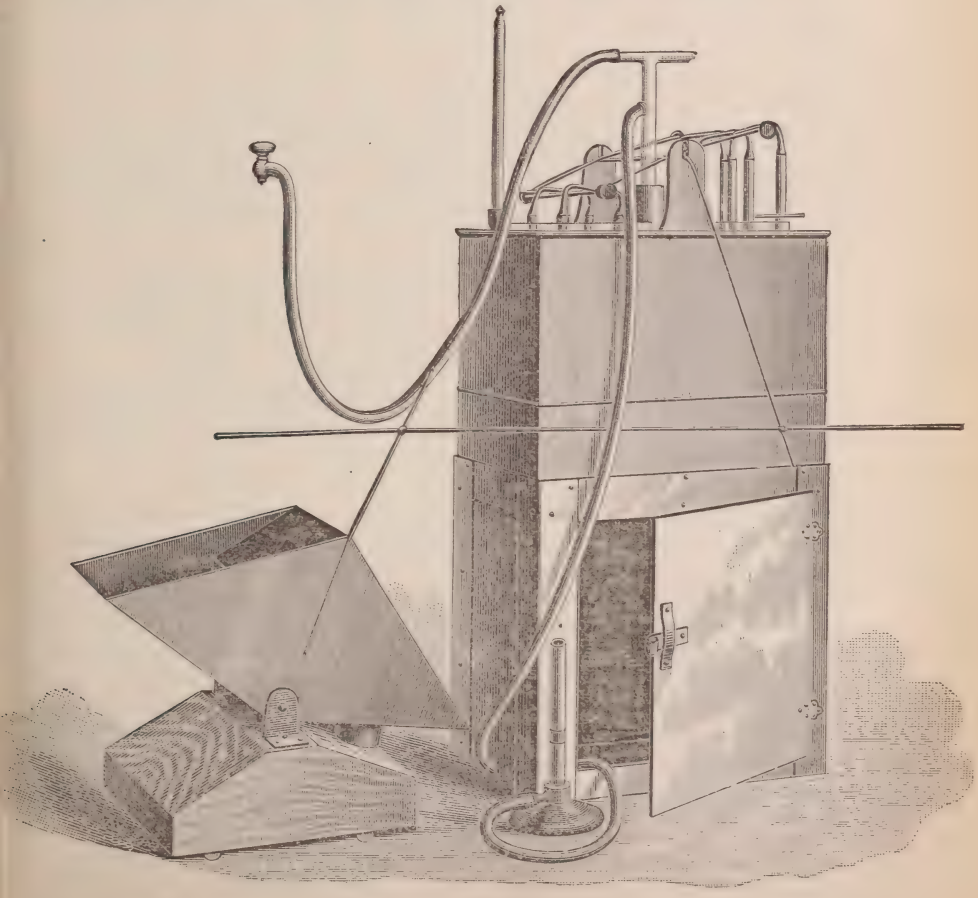
This can be explained in a simple way, for example (*a*), by digesting 5 grains of one pepsin with 500 grains of egg albumen in 11 fluidounces of acidulated water containing .3 per cent. of absolute hydrochloric acid, and 5 grains of another sample subjected to like conditions for an hour. At the end of this time, we find that the former sample has completely digested the albumen taken, while the latter has failed to dissolve completely the albumen taken, or about 90 per cent. found upon weighing the residue, showing that there is a difference, even in this test, in their digestive power. (Example *b*.) Now, if 3 grains of the former and 5 grains of the latter are taken and subjected to the same conditions as the foregoing, if it be found that at the end of an hour and a half both samples have nearly completely dissolved the entire albumen, it indicates that there must have been as much *active ferment in 3 grains of the former as there is in 5 grains of the latter*, and calculating this out in per cent., we would say that the latter contained three-fifths or sixty per cent. as much ferment as the former sample.

By experiment *C*, I wish to show how dissimilar results in digestive power can be obtained from the same pepsin. If one part of a pepsin of high digestive power, such as possessed by the one experimented with, is allowed to act upon 2000 (1), 2500 (2), 3000 (3), 4000 (4), parts of albumen for six hours by modified United States Pharmacopœia test (see schedule), it is found that the 2000 grains has been completely digested, and weighing the residue in the others, No. 2 has digested 2400 parts, No. 3 over 2700 parts, and No. 4 fully 3400 times its weight of albumen in the same length of time. Now we have four digestive powers ranging from 2000 to 3400, and which one of these are we to accept as the true digestive power of this sample?

Why are such different results obtained by this test? The reasons are that in all above the 1 : 2000, there have been different per cents. of excess of albumen exposed to the action of the ferment, and as an increase of the proportion of albumen to the pepsin increases the digestive power, the cause of the above results is easily explained.

If the results of the foregoing experiment are compared optically with those we have when comparing various pepsins by any official test, and also with the florid advertisements in the form of photographs, which are intended to show the comparative strength of various pepsins, the similarity is very striking, and illustrates the principle that the weaker pepsins have an advantage over the stronger, in having an excess of albumen to act upon in proportion to the actual amount of ferment contained in them, otherwise they would have completely digested as much as the weaker sample.

In testing pepsins, the change of temperature and amount of stirring during digestion being important to reach any uniformity of results from day to day, I have used an improved apparatus, devised to give a constant temperature and fairly uniform stirring, a description of which I give as stated by Chas. E. Parker, Ph. C., in the "Druggists' Bulletin" of May, 1888, and also reproduce a cut of the same.



Apparatus for Testing Pepsin.

The apparatus consists of a water bath with an attachment for agitating the mixture under examination.

The water bath is constructed to receive twelve large test tubes (5 ozs.), in which are placed the mixtures for artificial digestion The heat of the water bath is maintained within half a degree of constancy by a Reichert thermo-regulator automatically controlling the gas supply. A thermometer is inserted in the bath to indicate the temperature.

Over the cover of the bath is balanced a rocking frame, to which twelve glass rods are suspended, in sets of six, so that they have an equal up and down motion of about two inches. These rods hang in the test-tubes when in position, and each has secured to it by friction two discs of thick sheet rubber a little smaller than the tubes, one being at the lower end, the other two inches above it. The stirring is effected by the motion of the rods and discs.

The rocking frame is actuated by a motor which should be placed in the sink, and is connected by a stiff rod to a side arm on the rocking frame. This motor is a simple device of two triangular cups united, turning upon pivots at the lower angle. It is placed centrally under a water tap so that when full the weight of water tilts the upper cup over and discharges its contents, at the same time bringing the other cup upright under the tap in a position to be filled. Thus a jerky reciprocating motion is obtained, which is conveyed by the rod attached to the side arm.

The frequency of its action is regulated by adjusting the water-tap. It may be made to rock constantly or at intervals of several minutes.

It should be adjusted to act so often that a new impulse is given to the discs before the albumen has subsided after the previous motion.

This simple and cheap little motor may be useful in pharmaceutical operations where a uniform motion is not indispensable; it is, however, rather too sudden and violent for stirring during evaporation.

MR. SAYRE.—The paper is a very interesting one to me and most of my friends who know the trials I have gone through on the pepsin question. One of the most interesting papers on this subject was by Dr. Eccles. During last winter I got twenty-two young men to work in testing the same kind of pepsin, and requested them to report upon the acid strength which in their opinion would give the best results. The answers ranged from one-tenth to one and five-tenths per cent. of acid in the water. My own experience previous to that time has been that the best acid strength was 0.35, but I believe you can reduce it as low as three-tenths per cent. Yet I went over the ground again, and finally it was suggested to my mind that there might be a difference in the pepsin and that the acidity in that might account for the difference. Now I find that to be the key-note of the difficulty. There are pepsins having more acid in their composition than others, therefore such pepsins will require less acidulated water than the others.

DR. ECCLES.—I tried many different percentages a number of times and found that when going below 0.2 per cent. the amount of digestion became less by a rapid grading, and that when going above 0.2 to 0.3 or 0.4 the rate was not so very steady. Experiments had been performed in England, before my work was done, but I knew nothing about them, and these came to the same conclusion, that 0.2 per cent. was the best strength. The only advantage ot increasing the temperature is in the quickness of your work and in saving time. The products are entirely different; you produce instead of a peptone, a parapeptone, the higher the temperature is sent up, and that is all most poisonous to the human economy for the reason that in neutral solutions it is precipitated and in acid and in alkaline solutions it is dissolved. The blood is alkaline and the stomach is acid during digestion, and the walls of the stomach have a neutral point where the parapeptone fills up the pores of the stomach and starves the animal that feeds on parapeptone. In these experiments which have been going on in animals for millions of years, the temperature is correct and at 100° the greatest quantity of parapeptone is produced. That a weak pepsin has the advantage over the stronger, I think I pointed out years ago; one reason is that the surface is greater which it is working upon. The production of peptone is like hydraulic action, slow, and its final result is produced not immediately, but slowly. Hence there is left upon the surface of pepsin a large amount of work, so to speak, in the shape of jelly—that does not give a fair chance to the weaker pepsin, hence when you weigh the albumen it has more than counterbalanced the gain of the weak pepsin, so that the stronger pepsin had the advantage after all. The advantage of the weaker pepsin on account of greater surface is lost by the amount left upon the partially digested albumen which weighs against it.

Mr. Snow.—I tried several experiments some time ago, and I confess that I became a little skeptical as to the absolute value of the method adopted. I used raw egg albumen such as photographers use, and allowed digestion to go on at the usual temperature of 40° C., and afterward at 55°. The amount of peptone formed was in reality very small under these circumstances, when the action took place in the solution instead of on the surface of the liquid. But I never extended the experiments very far.

Mr. Bedford.—I saw an illustration of some pepsin digestion, and the paper which is yet to appear will give some information that it is an optical delusion as to showing the value of the dissolving powers of pepsin.

Mr. Eccles.—There has appeared an interesting paper in the English "Analyst." A gentleman three years ago proposed using very finely powdered dry albumen. I tried that plan, but could not get it to work. He seems to think he can work it. Mr. Thompson refers to the completing of digestion. Taking for instance two samples of pepsin, one of half the strength of the other, I would put say a grain of each pepsin to the same amount of albumen, and let the digestion proceed for an hour. Finding that number one digested all the albumen and number two only about half, then I would go over the experiment again, using a grain of number one as before, but two grains of number two. If I found that in an hour both of them completed the digestion, then I would conclude that both had the same amount of pepsin. If I found that number two did not yet finish the work, I would ascertain the proportion of albumen left undigested, and would make a third trial with a certain amount of pepsin, until the digestion was finished. In that way I believe all sources of error are eliminated, and the exact amount of pepsin to digest a certain amount of albumen in a given amount of time is ascertained. Recently the polariscope has been used to determine the amount of albumen in the solution. It is a very good method of approximation, but is subject to the objection that all the albumen digested is not in solution.

Mr. Seabury.—It is a well known fact that nearly every pepsin maker must, in the course of his process, make use of an antiseptic. They use either boracic or benzoic or salicylic acid, or other materials. May not this have some effect on these differences in the analysis? It strikes me that if you wish to get the strength of different pepsins, the only way is to try all the crude materials with one albumen, and then another albumen, and see if you can get exacts result by percentage.

Mr. Thompson.—I beg to take exception to Mr. Seabury's statement, since I am familiar with a process of manufacturing pepsin in which no antiseptic is used.

Mr. Seabury.—I know that antiseptics are used by some manufacturers.

Mr. Hallberg.—I suppose nearly all these remarks apply to scale pepsin. In the process of manufacturing scale pepsin, the stomach is macerated in the usual way with dilute hydrochloric acid, this liquid is expressed, filtered, and evaporated at a heat between 140° and 150° F. When it is reduced to a pretty fair consistency, it is carefully neutralized, but what the liquid is neutralized with I am not positive; either soda or ammonia is used. After it is reduced to a syrupy consistency, then it is spread on plates of glass to dry, the drying process being effected in the usual way.

Mr. Seabury.—I was speaking of my own knowledge in making the remarks I did. I believe that the analysts, knowing that various pepsins contain traces of antiseptics, might be able to plan a uniform process of analysis.

Mr. Eccles.—I would like to make a suggestion which may be of advantage to manufacturers of pepsin. In examining a number of brands of pepsin lately, I observed that those of high standard of excellence as digestive ferments are, as a rule, imperfectly soluble; that a part of it will not dissolve at all, but leave the solution in a translucent form, and that this, by standing, will settle to the bottom as an inert body. I have found one pepsin on the market that contains none of this sediment; and I know of one that if this mucus, or whatever it is, was separated, it would be a better pepsin than any now in the market. All they have to do is to remove this inert substance, and it ought to be a very easy matter to get rid of it. This variety of pepsin, which has none of this dirt in it, makes a perfect or nearly perfect solution, and is the highest peptonizing pepsin I know of. I will also state that a number of new pepsins in the market now are far better than many of three years ago. Pepsin is really increasing in quality.

Mr. Sayre.—Mr. Seabury's remarks seemed to convey the idea that in making scale pepsin it is necessary to use boracic or salicylic acid. Since the year 1881, when I was manufacturing scale pepsin, until I was told to stop, I never used any antiseptic whatever, but at that time these acids were tried, to see what effect they would have. But I could use them only in the very minutest quantities, with the exception of boracic acid, which would least interfere with the digesting power. But I may say that it is possible to make almost odorless pepsin without the use of boracic acid. I don't know what the present manufacturers are doing, but I want this Association to understand that such a pepsin can be made without the use of these chemicals named.

Mr. Remington.—May I ask you if that pepsin will keep well without an antiseptic?

Mr. Sayre.—If it is perfectly dry.

Mr. Remington.—I do not wish to controvert any statements that have been made here, because I know that the gentlemen who have spoken have had more practical experience than I had myself; but it seems to me that as the valuable part of the pepsin is the ferment, and since boracic, salicylic and benzoic acids, and corrosive sublimate, are all powerful antiseptics, and scince it is well known that they interfere with the action of ferments, that a solution of pepsin must be less active or non-active in the presence of boracic acid or other antiseptics, and that it would be very injudicious for the manufacturer of pepsin to send out such a preparation. Again, does not this also explain the effect of alcohol? I believe that alcohol does not destroy the activity of pepsin, but I believe that it retards its action on the same principle that it preserves a solution; probably pepsin could be preserved in an alcoholic solution; such preparations are on the market containing considerable alcohol, and yet they act as digestants. The question is merely to what extent will solution of pepsin bear preservation with alcohol or with a mixture of alcohol? I believe it is very well established now that the old idea, that alcohol destroys the digestive power of pepsin, is erroneous.

MR. STEVENS.—I had the same idea, especially in connection with elixirs. I thought that the influence of alcohol retarded the action, but that by evaporating the alcohol the pepsin left would be found the same as before. Therefore I made up different solutions of pepsin, 25, 50 and 75 per cent. alcoholic mixtures, let them stand three weeks, and then placed each in a small dish for evaporation at a uniform temperature. I tested these samples all alike, using the same albumen, and keeping the conditions as nearly alike as possible. I found all pepsins from liquids above 25 per cent. alcohol had decreased very much in quality, so that only a very small quantity of albumen was digested. Below 25 per cent. alcohol did not seem to have any effect. I did not carry the experiment as far as I would like to have done.

MR. ECCLES.—I have used alcohol upon pepsin and immediately evaporated it, but I had not kept the solution for any length of time. Perhaps many of you will recollect the discussion in the Association of a paper I read at Pittsburgh. That work was continued and finished up during the year, and I presented a paper to the Brooklyn Pathological Society, published in the New York Medical Journal and reprinted by the Brooklyn Pathological Society. In this paper you will find the retarding effect on digestion of almost any drug you have on your shelves in your drug store, with the amount of retardation, using the same pepsin all the way through.

MR. STEVENS.—I believe all that Dr. Eccles has stated on that point: using alcohol for a short time, it will not interfere.

The Section then adjourned until Thursday morning.

THIRD SESSION.—THURSDAY MORNING, SEPTEMBER 6TH.

Mr. Good presided. The Secretary read the minutes of the last preceding session, which were approved. On motion of Mr. Bedford, Mr. J. F. Geisler, of New York, was invited to read a paper on the assaying of opium. The paper was read as follows:

NOTES ON THE MORPHIOMETRIC ASSAY OF OPIUM.

BY JOSEPH F. GEISLER, NEW YORK.

The recent discussions in pharmaceutical journals on the subject of the morphiometric assay of opium have attracted much attention. Inasmuch as the medicinal virtues of opium depend principally upon the percentage of morphine, it is of the utmost importance to the profession to know the exact quantity of morphine in a given specimen of opium or its preparation. Most of the methods of the morphiometric assay of opium may be classified under two general heads: Those using simply water as a solvent, and those using lime. Each class has merits of its own under certain conditions, but it is an established fact that either class will not work equally well on opiums of all grades and varieties. Experience is required to get the best results by any method, for strict adherence to details contributes much to a correct and successful assay.

This paper will be confined principally to the analytical discussion of some of the theoretical and actual errors of the U. S. P. method for the assay of opium adopted in the Pharmacopœia of 1880.

For the benefit of those not familiar with the method, the details are given herewith:

"Opium in any condition to be valued, seven grams (7), lime freshly slaked, three grams (3), chloride of ammonium, three grams (3), alcohol [sp. gr. 0.820], stronger ether [sp. gr. 0.725], distilled water, each a sufficient quantity. Triturate together the opium, lime and 20 c.c. of distilled water in a mortar, until a uniform mixture results; then add 50 c.c. of distilled water, and stir occasionally during half an hour. Filter the mixture through a plaited filter, three to three and one-half inches in diameter, into a wide-mouthed bottle or stoppered flask (having the capacity of about 120 c.c., and marked at exactly 50 c.c.) until the filtrate reaches this mark. To the filtered liquid (representing 5 grams of opium) add 5 c.c. of alcohol and 25 c.c. of ether, and shake the mixture, then add the chloride of ammonium, shake well and frequently during half an hour, and set it aside for twelve hours. Counterbalance two small filters, place one within the other in a small funnel, and decant the ethereal layer as completely as practicable upon the filter. Add 10 c. c. of stronger ether to the contents of the bottle and rotate it, again decant the ethereal layer upon the filter, and afterward wash the latter with 5 c.c. of stronger ether, added slowly and in portions. Now let the filter dry in the air, and pour upon it the liquid in the bottle, in portions, in such a way as to transfer the greater portion of the crystals to the filter. Wash the bottle and transfer the remaining crystals to the filter with several small portions of distilled water, using not much more than 10 c. c. in all, and distributing the portions evenly upon the filter. Allow the filter to drain, and dry it, first by pressing it between sheets of bibulous paper, and afterward at a temperature between 55° and 60° C. Weigh the crystals in the inner filter, counterbalancing by the outer. The weight of the crystals in grams, multiplied by twenty (20) equals the percentage of morphine in the opium taken."

The queries which suggest themselves concerning this method are:

1. Does the lime treatment extract all the morphine?

2. Does the aliquot part (50 c.c.) of the filtrate represent the proportional equivalent of 5 grams of opium?

3. Is all the morphine recovered from the aliquot part taken?
4. What is the purity and character of the crystals obtained?

The first of these queries, time did not permit me to investigate sufficiently to present reliable analytical data.

The second query has been subjected to analytical inquiry by a number of careful investigators. The question, however, is still a disputed one. To solve this question the following experiments were undertaken, with results as indicated below.

Theoretically the volume of the solution of the opium assay will be affected by the quantity of the soluble matter in the opium taken. It is safe to say that each gram of water in the opium taken will increase the volume of the added water by one (1) c.c., so that opium of different degrees of moisture will, from this source alone, affect the volume of the solution according to the percentage of moisture in the sample taken. Secondly, the volume will be further affected by the quantity of the soluble matter of the opium other than water. Opium as a rule contains from sixty (60) to sixty-five (65) per cent. of soluble matter, but the solution of much of this is prevented by the lime and the limited quantity of water. The soluble solids of opium which go into solution will have a tendency to increase the volume of the solution by about 60 to 63 per cent. of their weight. It seems therefore from theoretical deductions that 50 c. c of the filtrate will seldom represent exactly 5 grams of opium.

To demonstrate this, two samples of opium, A and B, containing respectively 8.0% and 7.13% of moisture, were submitted to assay under the following conditions: Into a tared Erlenmayer flask containing a weighed rubber-tipped glass rod, 7 grams of opium were placed, followed by 3 grams of freshly slaked lime, (3 pts. lime to 1 pt. of water) and 70 c.c. of water. The weight of the whole was accurately noted. The contents of the flask were then thoroughly mixed and stirred during one hour. This is somewhat longer than the U. S. P. method directs. It is not always practical to stop the maceration at the end of half an hour, so that this deviation, though slight, must be taken into account, although it may not cause any practical difference in the results. The maceration in the flask was adopted to avoid loss by evaporation, which from an open mortar is often quite considerable, as was verified by direct weighings. On completion of the maceration, the magma was filtered through a filter paper, the weight of which with the funnel was previously noted. Precautions were taken to avoid evaporation during the filtration. A little over fifty c.c. were collected in a tared flask and the weight of the whole immediately taken. The residuum on the filter, with the filter, funnel, flask and glass rod, was dried at 100° C., and the increase in weight noted. A portion of the collected filtrate was evaporated, the residue dried at 100° C., and the quantity of solid and water determined, from which data the relative volumes were calculated.

The following are the analytical data.

Opium A, containing 8 per cent. moisture.

$$\left.\begin{array}{ll}\text{Flask + rod} & = 43.385\text{ g.}\\ \text{Funnel} & = 41.050\text{ g.}\\ \text{Dried Filter} & = .884\text{ g.}\end{array}\right\} + \text{ residuum dried at } 100^\circ\text{ C.} = 93.330.$$

tare = 85.319.

Total tare 85.319. Solids in residuum = 8.011.

Total weight of filtrate collected = 52.841 g. of sp. gr. 1.0173 at 15.5° C. Hence volume of collected filtrate = 51.942 c.c.

Total weight of material taken, 7 g. of opium + 3 g. slaked lime + 70 c.c. water = 80 g., 80.000 g. —52.841 = 27.159 g., total weight of residuum on filter.

27.159 g. residuum on filter—8.011 g. solids = 19.148 g. water in same.

Of the collected filtrate 8.6027 g. evaporated and dried at 100° C. gave .3077 g. solids, whence the difference = 8.295 g. water. The weight of water in the 52.841 g. (= 51.942 c.c.) of collected filtrate is therefore 50.9509 g. water. From these data the total volume of the liquid may be calculated by the equation $a : b :: (a + d) : x$, in which a is the weight of the water in the collected filtrate, b the volume of the same, and d the weight of water in the residuum. $50.9509 : 51.942 :: (50.9509 + 19.148) : x = 71.46$ c.c., total volume of the solution.

Opium B = 7.13 % moisture.

Flask, funnel, rod, paper = 85.064 g., + residuum dried at 100° C. = 93.120 g. = 8.056 g. solids in residuum.

Weight of filtrate collected = 52.549 g., sp. gr. at 15.5° C. 1.0178 = 51.629 c.c., volume of collected filtrate. 80.000 — 52.549 = 27.451 total residuum on filter — 8.056 g. solids = 19.395 g. water.

9.1125 g. filtrate dried at 100° C. = .3385 g. solids, hence difference = 8 7740 g. water, whence 50.596 g. water in filtrate collected.

$50.596 : 51.629 :: (50.596 + 19.395) : x = 71.419$ c.c. total volume of solution.

It is thus seen that the 70 c.c. of added water were increased in volume to 71.46 and 71.41 c.c. respectively in the two assays. It will be noticed that in the above calculation it is taken for granted that the character of the filtrate is the same as the liquid portion remaining in the residuum on the filter, that is, equal volumes of each will contain the same quantity of soluble solids. This point is disputed by some. I have, however, not seen any data which will support the objection, and which are not open to criticism. Further no account is taken of any decomposition during drying. What these experimental errors would amount to it is difficult to say. They would, however, not materially alter the conclusion to be drawn from the above data, which are given in sufficient detail to be available for correction in case any error appears in the modus operandi adopted.

It is shown, therefore, that in these assays 50 c.c. of filtrate represented less than 5 g. of opium, the actual quantities being 4.897 and 4.9 g., causing a loss in the assay of .25 and .24 per cent. morphine respectively, in an opium assaying 12 per cent. morphine.

The third of the above queries is readily answered. It is not to be supposed that all the morphine can be recovered in a pure state by a single crystallization from such a complex solution as the concentrated infusion of opium. The object, therefore, is to produce the morphine in as pure a condition as possible, so as to avoid unnecessary after-treatment, and it becomes a question whether the impurities contained in the weighed morphine counterbalance the morphine lost in the crystallization and subsequent treatment. Some of the older methods weighed morphine of a notoriously impure character.

In the U. S. P. method, the yield of the morphine is affected by the quantity of alcohol and calcium and ammonium chloride contained in the crystallizing liquid. To decrease the solvent power of these, ether is added as an anti-solvent, as well as for facilitating a pure precipitation of morphine.

To illustrate how different quantities of lime and ammonium chloride affect the results, the following two assays were conducted per U. S. P. method, using .600 g. of pure crystallized (finely pulverized) morphine in place of opium.

Assay A.

.600 g. morphine with lime and NH$_4$Cl as per U. S. P., method. Yield of morphine = .360 g. ÷ .4285 (equivalent for 50 c.c.) = 84.01 per cent. morphine recovered by assay.

Assay B.

.600 g. morphine, 1.5 g. slaked lime, and .8 g. NH$_4$Cl as per U. S. P. method. Yield of morphine = .3935 g. = 91.83 per cent. recovered.

Hence in A the loss of morphine was 15.99 per cent., while in B, with lime and NH$_4$Cl decreased the loss amounted to only 8.17 per cent.

In opium, however, this vast loss of morphine is to a considerable extent decreased by the presence of the soluble matter extracted from the opium.

The principal loss of morphine is that in the mother liquors, as will further be seen from the assays of an opium which gave exceptionally low results by the U. S. P. method.

Opium "O" = 5.35 per cent. moisture.

No. 43.	U. S. P. method .	a.	10.48	per cent.	morphine	average 10.525 per cent.
No. 44.	U. S. P. " .	b.	10.57	"	"	"	
No. 40.	U. S. P. modified	c.	11.38	"	"	"	
No. 41.	U. S. P. "	d.	11.14	"	"	"	

The modification in 40 and 41 consisted in using only 1.5 g. lime and

.8 g. NH_4Cl with the quantity of alcohol also decreased to 3 c.c. in No. 40 and 4 c.c. in No. 41. The influence in the quantity of alcohol used is quite perceptible here, a difference of 1 c.c. alcohol having caused a difference of .24 per cent. morphine in the assays, while the influence of the smaller quantities of lime and NH_4Cl is still more marked, the percentage of morphine having been increased .62 and .86 per cent. over the U. S. P. average. The crystals in each of these four assays were exceptionally pure and white, dissolving completely to a clear solution in officinal lime water. The filtrates of the U. S. P. assays No. 43 and No. 44, with the ether and other washings from the assays, were combined, the whole therefore representing 10 g. opium.

The combined solutions, after acidulating, were concentrated on the water-bath to remove the alcohol and ether, and finally exhausted with ether as long as the same removed coloring and other matter. The ether washings were reserved. The water solution was then further treated with several washings of amyl alcohol, the latter with the reserved ether washings thoroughly washed with acidulated water, and the water washings concentrated and added to the main bulk. Amyl alcohol was again added, the solution made alkaline with an excess of ammonium hydrate, and the extraction continued to exhaustion. The amyl alcohol extracts were first washed with water, and then with water containing a slight excess of hydrochloric acid, so that the water washings were acid in reaction. This acid water solution containing all the alkaloid was evaporated twice on the water-bath to remove the amyl alcohol and excess of hydrochloric acid. It was then transferred to a crystallizing flask and diluted to 7 c.c., 5 c.c. of alcohol was now added, together with 20 cc. of ether, followed by 1.25 c.c. of 10 per cent. water of ammonia. The whole was thoroughly shaken and allowed to crystallize for 48 hours. The resulting crystals were washed with "morphiated spirit," "morphiated water," and finally benzol, and were comparatively pure. The crystals weighed .1033 g., indicating 1.033 per cent. morphine, which was lost in the U. S. P. assays, No. 43 and 44. All the morphine, however, was not recovered by the above treatment, for the percentage of morphine in opium "O" as determined by three other methods of assay, each performed in duplicate, and all agreeing very closely, was found to be 12.32 per cent., so that in this opium the U. S. P. method yielded 1.795 per cent. less than the true quantity of morphine contained therein. The opium it will be observed was quite dry, and it is possible that this may have influenced the results; but for all the confirmatory assays the opium was used in the same condition as to percentage of moisture. The yield and purity of crystals is affected decidedly if the crystals on the filters are not first thoroughly dried between bibulous papers. To accomplish this readily it is expedient to compress the filter papers containing the crystals, place them between two pieces of blotting or filter paper, and then press thoroughly between toweling until all excess of moisture has been expressed, as determined by observing whether the filters when compressed between fresh blotting or filter paper, dampen the same. This also facilitates the drying.

The losses of morphine in the U. S. P. assays of opium "O" were exceptionally large. Two other varieties of gum opium gave much better results.

	Opium A.	B.
U. S. P. method . . .	11.60 per cent. morph.	12.94 per cent. morph.
U. S. P. modified . .	11.35 " " "	13.12 " " "
	Opium C.—8.0 per cent. moist.	D.—7.13 per cent. moist.
U. S. P. method . . .	11.82 per cent. morph.	13.89 per cent. morph.
U. S. P. modified · ·	12.30 " " "	14.36 " " "

The opiums C. and D., assayed by Stillwell's modification of Squibb's method, yielded 12.31 per cent. and 14.70 per cent. morphine respectively, so that in C. the deficiency amounted to. 49 per cent. and in D. to .81 per cent. per U. S. P. method, while in the modification (see assays No. 40 and 41 of opium "O" above) were much closer, C. showing a deficiency of only .01 per cent. and D. a loss of .24 per cent. These assays are certainly instructive in demonstrating how differently different varieties of opium work with the U. S. P. method.

PURITY AND CHARACTER OF THE CRYSTALS.

In a properly conducted assay the U. S. P. crystals are certainly exceptionally pure. An average lot of morphine, yielded by the U. S. P. method from different varieties of opium and laudanum, gave but little residue when treated with lime water, and by titration with oxalic acid, standardized on pure morphine, the purity of the crystals was found to be 96.94 per cent. As a rule the crystals are purer than this. I have frequently found them 98.0 to 99.8 per cent. pure, as indicated by titration with standardized oxalic acid.

Several investigators have lately called attention to the loss of water of crystallization of morphine when dried at 100° C. The U. S. P. directs the crystals to be dried at not over 60° C. Experience teaches that that temperature should not be much exceeded. Methods directing the crystals to be dried at 100° C. frequently weigh partly dehydrated crystals. Pure crystallized morphine, $C_{17}H_{19}NO_3.H_2O$ contains 5.94 per cent. of water of crystallization.

Some pure morphine was prepared from commercial "pure morphine" by subjecting the latter to the following treatment: ⅛ oz. of crystals were finely pulverized, washed with "morphiated spirit," dried, then washed with repeated portions of benzol, the crystals then dissolved in q. s. water acidulated with hydrochloric acid, the whole diluted to 100 c.c., and 5 c.c. of alcohol and finally 5 c.c. of water of ammonia added, the whole shaken and allowed to crystallize, transferred to a filter, and washed with water until free from chloride and ammonia; the crystals then compressed between bibulous paper and finally dried at 55° C. to constant weight. Recovered 92.3 per cent. of amount taken.

The crystals thus prepared, when dried in an air-bath at 100° C., lost all their water of crystallization in four hours. The loss amounted to 6.081 per cent., or .141 per cent. in excess of 5.94 per cent., the true amount for pure crystals.

The U. S. P. crystals of morphine contain rather more water than this, as will be seen from the following nine determinations, representing morphine from as many different U. S. P. assays. The crystals in each case were dried at 100° C. to constant weight. Most of the crystals lost all their water of crystallization in 4 hours, while a few suffered a slight further loss by 5 to 8 hours longer drying at the above temperature. The total loss in weight for the respective lots was 6.83 per cent., 6.88 per cent., 6.75 per cent., 6.73 per cent., 6.51 per cent., 6.83 per cent., 6.93 per cent., 6.86 per cent., 6.81 per cent., which is an average of 6.79 per cent. water in the U. S. P. crystals. None of these crystals, as well as the sample of pure morphine, suffered any further loss by drying at 120° C. for 3 hours, thus demonstrating that all the water of crystallization is lost at 100° C., by from 4 to 12 hours drying.

When the U. S. P. assay is properly conducted, the crystals seldom contain over 4. per cent. of impurities.

It is evident from the data obtained, that with some opiums the U. S. P. method gives results considerably below the truth, and although the results are uniform, duplicates agreeing well with each other, the results can not always be relied upon as giving the true percentage of morphine in an opium.

MR. MAISCH.—This paper should not be passed over without some remarks; and in order to bring out more prominently the points connected with the subject, I desire very much to ask the author of the paper, whether there is any objection to the using of boiling water for assaying opium, and if so, what the objection is.

MR. GEISLER.—In extracting the opium with hot water many impurities will be found in the precipitated morphine afterwards which are not removed, and which are on that account objectionable.

MR. MAISCH.—That has been the trouble always with the old method, proposed by Thiboumery, and modified by Mohr, which perfectly agrees with my own experience. I believe Mr. Geisler also recommends the reduction of lime and ammonium chloride on account of the solubility of the morphine, which agrees also with my experience. But the point I am not clear about is this: Suppose we use the process for an opium containing between 9% and 10% of morphine, and we have an exceptionally good opium containing 14 or 16%; how is the difference to be shown?

MR. GEISLER.—The quantities indicated are sufficient for opium containing from 8 to 9% of morphine. For precipitating more than that you would have to increase the reagents somewhat.

Mr. Maisch.—Then, as I understand, using the reduced quantities of reagents there would be a loss of morphine by this method, and the percentage of morphine would fall say from 15% to about 12%.

Mr. Geisler.—The loss is considerable, and I am sorry that I omitted that point. I have found the loss to be 1% of morphine as the total.

Mr. Maisch.—But if we worked with a quantity of lime and chloride of ammonium sufficient for say 15% of morphine, and if the opium should contain 12% of morphine, then the loss of morphine sustained would be trifling.

Mr. Geisler.—It would not amount to much.

Mr. Maisch.—That is the point I wished to be sure of.

On motion of Mr. Painter, seconded by Mr. De Forest, the members present of the Michigan State Pharmaceutical Association, and all others interested in the subjects, were invited to participate in the discussions.

Mrs. Upson read the following paper:

SPONGES.

BY ROSA UPSON, M. D., MARSHALLTOWN, IOWA.

The great advance which has been made in our knowledge of sponges during the last few years has been greatly due to the efforts of evolutionists in their efforts to establish their theory. The possession exclusively of common characteristics marks them as belonging to a group independent of the rest of the animal kingdom. The true living being which constitutes the sponge is of a soft gelatinous texture, and with the aid of a microscope is found to be an aggregation of separate bodies provided with flagella. Without going deeply into the histology of the little animal, it will be interesting to those who have not taken the trouble to learn anything of the sponge except its mercantile value, to know something of its habits, and to have a few of the beauties of its existence pointed out.

The sponge, lives as do all animal kind, by feeding. The simplest known sponge is a hollow, vase-like sac, closed at one end, by which it makes its attachment, opening at the other end in a large vent, and its walls filled with perforations, the pores. Through the activity of the flagella with which this little animal is supplied, there is a continual outflow of water from the vent and a gentle flow through the pores inward. The instreaming currents carry with them into the cavity of the sac infusoria and other food organisms, the digestible portions of which are retained and the insoluble portions together with the fluid excreta are carried out of the vent by the recurrent flow. The sponge propagates from ova and spermatozoa. The walls are strengthened by some kind of a skeletal structure, which is composed of calcareous, silicious or fibrous spicular deposits. Foreign bodies sometimes contribute to the formation of this skeleton. The calcareous skeleton has spiculæ composed of carbonate of lime, which is often a single crystal surrounded by axial fibres of organic matter. The silicious spiculæ consist of colloid silica, and can only be distinguished from calcareous by having no influence upon polarized light, their structure being very similar. Continuous skeletons are not always formed, but the spiculæ overlap in such a manner as to form a foundation, and the formation of fibres binding them together, in time produce the skeleton by protoplasmic continuity. The removal of the living matter from the network of elastic fibres leaves remaining the skeleton of the animal, which is the sponge of commerce.

Of the almost numberless families, classes and varieties of sponges, only four species are in common use. The Turkey or Levant sponge, which is the softest, finest in texture and most valued, is distinguished by its soft, thin and elastic fibres, its light color and the irregularity and thickness of its chief fibres, which are covered with sand. The Zimocca sponge is harder than the Levant, its chief fibres are more regular and free from sand, the uniting fibres are dense and thick, and to these it owes its characteristic hardness.

The horse or common bath-sponge has no regular radiate arrangement of its chief fibers, and has nearly always a thick cake-like form. These are of several varieties, and of different textures, of which the yellow "lamb's wool" and "velvet" are specimens. The major part of the sponges of commerce are brought from the Mediterranean sea coast; the finest from the Syrian and Asiatic coasts and various islands of the Archipelago. Bath-sponges are found abundantly on the shores of the Bahamas and Australia, in the North Pacific, South Atlantic and Indian Oceans.

Sponges grow attached to rocks, stones and other objects at various depths. In shallow water they are harpooned, at greater depths they are brought up by divers; and at the depth of 50 to 100 fathoms they are dredged with a net. The harpooning is done with a five-pronged fork with a long wooden handle. The Dalmatians use a smooth stone covered with oil, which is thrown in advance of the boat and leaves a track through which the bottom of the sea can be seen, and thus assist the fishers in finding the sponge. Five thousand men and boys are employed in the Bahamas in harpooning.

Diving is practiced in the Mediterranean. The diver goes down with a slab of stone to serve as a sinker, and a cord attached to himself which communicates with the surface. On reaching the bottom, whatever sponge he sees is hastily gathered and placed in a bag about his neck, the signal is given by the cord, and he is drawn up. The work is severe, and often the diver finds nothing in his descent. Divers who wear the diver's dress with pumping apparatus, it is said can remain under for an hour, at a depth of 10–15 fathoms, but at greater depths only a few minutes.

Dredging is the safest and most profitable way, and is done with a net drawn along the bottom by a tow-line attached to the vessel or hauled in from the shore. Sponge cultivation has been attempted off the Dalmatian coast and also off our own coast of Florida, but as yet with little encouragement. The preparation of sponge for the market is a careful process. The sponges are exposed to the air or buried in dry sand until decomposition sets in, then are exposed in wire cages to the action of the tide, and are beaten and otherwise handled until the soft tissues are removed, after which they are washed again thoroughly and hung up to dry, and finally pressed into bales for market. On reaching the wholesale house they are often cut to a symmetrical shape and further cleaned. To add to the attractive appearance of the sponges, they are often bleached. The finest and softest are selected, washed several times in water, and immersed in very dilute hydrochloric acid to dissolve out the calcareous matter. Having been again washed, they are placed in another bath of dilute hydrochloric acid to which 6% of hyposulphite of soda dissolved in a little warm water has been added. The sponge is left in this bath 24 hours, or until it is thoroughly bleached, when it is again washed in clean water. As this process naturally impairs the durability, but few sponges should be bleached at a time. The process of dipping the sponge for five or ten minutes into a 2% solution of potassium permanganate, and afterward immersing it in a 2% solution of oxalic acid to which a little sulphuric acid has been added, is said not to affect its durability, and leaves the sponge beautifully white.

Iodine seems to represent the only medicinal property which has thus far been ascribed to the sponge. As far back as 1811 it was found that the peculiar efficacy of the ashes of sponge in the hands of the physician, was due to the iodine it contained. Sponge is familiarly employed for domestic and surgical purposes which require the use of a porous, compressible, or elastic substance. Its porous quality makes it particularly available for the purpose of absorbing blood, pus and other liquids, and its elastic quality renders it an efficient means of dilating sinuses, etc. For this purpose the compressed sponge or sponge-tent has become familiar to every physician.

Mr. Todd having bean called upon by the chair to read a paper upon a still for the distillation of volatile oils, exhibited a model of such an apparatus, and spoke of the different forms and sizes of stills formerly in use, and their gradual perfection; and then read the following:

THE DISTILLATION OF ESSENTIAL OILS.

BY ALBERT M. TODD, NOTTAWA, MICH.

The principal parts of an essential oil distillery are three in number: a boiler for the generation of steam, a pair of large wooden vats in which the plants are to be placed, and a condensing apparatus. Accessory to these are steam pipes, valves, hoisting apparatus, etc., which will be mentioned hereafter.

As this paper is intended to cover the requirements of those who wish to erect works of moderate capacity, specifications for such will be first given, which can be erected at an expense of less than $300, not including a building, however; it is not absolutely necessary that the works should be enclosed, although extremely desirable.

A cheap and efficient form of boiler for a moderate distillery is constructed with a flat bottom and an oval top of sheet-iron, being penetrated by two flues for increasing its surface. Such a boiler and appurtenances can be purchased for about $50. It should be about 2½ feet in width across the bottom, and about 10 feet in length, and placed upon a suitable foundation or arch of brick to admit of a copious fire being built underneath; such a boiler will furnish sufficient steam for the distillation of about six tons of peppermint plants in ten hours. Where a greater rapidity is desired, it is necessary to use a larger boiler, which in such case should be constructed of boiler-plate, the stationary tubular form enclosed in an arch of masonry being preferable, having a rated capacity of about 20 horse power.

The distilling vats should be two in number, about 6 feet in height and of the same maximum diameter, and are set so that a line uniting their centres will be parallel with a line drawn lengthwise through the centre of the boiler; they should be placed about 12 inches apart, and about 6 feet from the boiler, so that sufficient room may be given for placing a small engine between. Where greater rapidity of work is desired, the number rather than the size of vats should be increased, with a corresponding increase of the steam generating capacity. They should be constructed of the best quality of lumber—pine being preferable—1½ inches in thickness, the staves being slightly narrower at the bottom than at the top, so that the top shall have a diameter about six inches greater than the bottom. The staves are held together by heavy iron bands, four in number. The bottoms of the vats are built solid, similiar to the head of a barrel. The cover is made by bolting together, by means of two batons placed 3 feet apart, planks each 2 feet in width and 1½ inches in thickness, side by side. These batons are bolted at right angles with the plank, and are placed over the vat in such a manner that the edges of the plank shall form a line parallel to a line drawn from the centre of one vat to the other. The cover may be thrown backwards away from the platform out of the way of the workmen, afterwards a workman inside describes with a pencil on the lower side of the cover the conformation of the vat.

The cover is now made to conform to the mark described, the edge being bevelled to agree with the slight bevel of the vat, after which hinges are fastened on to the ends of two batons, being also attached to a heavy plank on which they can be made to swing so that they may be readily opened and closed. The vats are also provided with false perforated bottoms placed about 2 inches above the solid bottom, to allow the steam which enters underneath to be diffused and pass up evenly through the plants; an opening is also made in the bottom of the vat, fitted with a wooden plug for the removal of the water which accumulates at the bottom by condensation of the plants.

The distilling vats are connected with the boiler by pipes supplied with valves which enter through the side just below the perforated bottom referred to, the steam being let into either or both, as may be desired. Just underneath the cover in the sides of the vats nearest the boiler, circular openings 5 inches in diameter are cut, to which are fastened copper or galvanized iron pipes of the same diameter leading to what is called the "changing valve," which consists of an iron box about 14 inches in length, 7 inches in width, and 6 inches in height; this box has at the bottom two flanges to receive the two pipes mentioned, and is supplied with a large flat valve which is made to slide back and forth over the bottom by a handle operated from the outside, passing back and forth through a "stuffing box;" the upper side of this box is also provided with a single flange of the same diameter to receive the pipe for the escape of the steam to the condenser. By means of this "changing valve," steam may be made to escape from both vats at once or either may be closed at pleasure, and in any case the opening above will be free for the escape of the steam.

The condensing system which I find to give the best results, after many years' trial, consists of two pipes of extra coated tin plate 7 inches in diameter and 15 feet in length, placed one above the other 1 inch apart, and opening into each other at both ends; these will be found better than a larger number of shorter ones, as less perpendicular space is required, as well as fewer joints and corners, which are objectionable owing to their tendency to rust. Over this condenser is placed a long galvanized iron trough, which is perforated to allow the water with which it is supplied to flow evenly over the condenser; if the supply of water is adequate, the distillate should be entirely condensed in this primary condenser referred to, but, for the purpose of reducing it to a uniform temperature, sufficiently low to avoid loss in the atmosphere, it is connected at the extremity furthest from the vats with a worm, which should be made of block tin, 100 feet in length, 2 inches in diameter, being spun in one piece to avoid joints or uneven places therein. This worm is twisted spirally in circles about 4 feet in diameter, and is placed in a wooden vat called a "worm-tub" which is constructed of the same material, form and size as the distilling vats, except that it is not provided with a cover; the lower end of the worm passes out through the side of the vat a few inches above the bottom. The worm should be supported in a frame having suitable bearings every 12 inches, as the block tin pipe being soft and fragile would otherwise become depressed between the bearings simply by its own weight, and would thus be unable to properly discharge its contents.

Receivers for the collection of the distillate and the separation of the oil are of two kinds; those used in the distillation of oils lighter than water are constructed as follows: They consist of a galvanized iron vessel 10 inches in diameter and 30 inches in height; 4 inches below the top an opening is made in the side of the vessel to which an elbow is fitted, the upper rim of which is supplied with a funnel-shaped top rising 2 inches higher than the body, into which the distillate flows. The receiver is also supplied with an exterior pipe opening from the bottom for the exit of the water, and rising to a height about 1 inch lower than the top of the body of the receiver. A tight-fitting cover is also provided to keep out particles of dust and leaves.

Where oils heavier than water are distilled, the construction is as follows: A cylinder 2 feet in diameter and of equal height is fitted with a conical bottom at the apex of which is an opening 1 inch in diameter fitted with an elbow, to which is attached a horizontal pipe 14 inches in length passing outwards through the rim on which the body of the receiver rests; the outward end of this pipe is supplied with another elbow, one arm of which points upwards, to which is attached a perpendicular pipe 40 inches in height, which is in turn supplied at its upper end with a valve for the escape of the oil as it accumulates.

An engine will also be found useful for supplying the water to the condensing apparatus, as well as for returning the distilled water to the boiler for reconversion into steam. In ordinary works the pumping of the water is all that would be required of the engine, and in such case one of not exceeding two horse power will be ample. A reservoir, which should have a capacity of about ten barrels, is placed above the condenser for supplying the perforated trough referred to with cold water. In the erection of a distillery, the foundation for the boiler should be first laid; after the boiler is placed in position, the next in order is the setting of the vats; these should be so placed that if the ground is level their tops will rise about 5 feet above the ground level; 12 inches below the top of the vats a floor or platform is placed upon joists resting upon a solid frame-work, for the storage of plants and the convenient working of the distillery; this floor or platform should be sufficiently large to admit of the storing of several loads of plants, and should also be able to support a heavy hoisting crane used for elevating the distilled plants from the vats and swinging the same on to a car suitable for removal. The central bearing of this crane is placed at a point where the line passing between the two vats meets a line drawn from one edge of the vats to the other on the side furthest from the boiler; the arm of this crane is supplied with pulleys, crank and windlass, so constructed that its centre of draft is over the centre of each vat as it swings around. As accessory to the hoisting apparatus, three grappling attachments are constructed (one for each vat, and an extra one to avoid delay when unloading), as follows: heavy iron hoops 4 feet in diameter, nearly equal to the bottom of the vat, are supplied with two iron cross-bars, and also with four chains, which chains are fastened to the hoops by rings attached thereto at equal distances from each other; these chains are united to each other in pairs by rings at the top, the chains being of such length that when the hoop with its cross-bars is laid on the perforated bottom referred to, and the rings are fastened at the top of the staves, the chain lies against the side of the staves, hanging loosely at the bottom. A car is also provided for the removal of the plants, supplied with ordinary car truck wheels which run on a track, the rails of which may be constructed of wood 4 inches square placed 30 inches apart; this track after traversing the floor or platform is continued outside by being built upon trestlework, so that the plants, after being distilled, may be removed outside and thrown on a wagon for removal to the fields.

MR. PAINTER.—The free surface requires a very much longer time for condensing than would be required with an abundant supply of water; in other words, condensing in that way would take very much more pipe.

MR. TODD.—In some of my experiments I have attached a condenser such as constructed by Prof. Remington. This condenser was only two and a half feet in length and seven inches in diameter; it was tubular in form, and was used during the winter when my other condenser happened to get out of order on account of freezing, and using a vast amount of water the condensing was accomplished at an extremely rapid rate. But on a large manufacturing scale it is more economical to increase the surface of the condenser, because the pumping of the water is but a very little item; and after several years of work, I find that a condenser for a large distillery is more economically worked, having the condensing pipe thirty feet in length and seven inches in diameter with an abundant supply of water. I should say at a rough estimate that the amount of water passing over that condenser is about one thousand barrels a day. If a condenser one-third of that size were used it would require perhaps three thousand barrels a day, and then you could hardly depend upon its working satisfactorily. If the condenser is too small, the vapors pass through with great rapidity and without condensing.

MR. REMINGTON.—I would call attention to the fact that we have another example here of the well-known principle that in operating upon an immense scale the apparatus which is designed to effect the purpose must be specially constructed. It very rarely occurs that an apparatus constructed for operations on a small scale can be enlarged for a certain purpose. Now in the condenser which Mr. Todd has alluded to, you will notice that it is specially adapted to the use of the retail druggists and to distilling a variety of products, recovering alcohol from odorous drugs, and so on. Here we have, on the other hand, an apparatus which is intended to recover but one product. Mr. Todd has carefully taken into consideration the volume of water which is available for condensing purposes, and this is really the most important to be considered in calculating the service of the condenser, and considering the objects to be accomplished. I have no doubt this is very efficient, and as efficient a condenser as can be devised with the object in view, and this brings me to the point upon which I wish to speak. I have received a great many letters from persons throughout the country asking about starting stills for the manufacture of oil of gaultheria and oil of sassafras; the impression seems to be that only one kind of still will answer, while it is true that you must consider the supply of water you have to draw upon and also what you are going to do. If you operate on a large scale, you certainly cannot use a still that would be useful in a laboratory where the work is entirely different, and a still of a totally different construction would be required. In other words, you must have an apparatus adapted for large operations, and not one adapted for small operations.

MR. EBERT.—One of the most important features of a condenser that is generally overlooked, is: that it ought first to be considered what the temperature of the distillate is, and then the temperature of the water used for condensing. There is a great difference in different seasons in the temperature of all waters, and particularly of surface waters, which are frequently used for condensing. Sometimes water is used which comes from a well twenty, thirty or forty feet in depth, and such water usually has a temperature of from 50 to 60 degrees. Now, if you take into careful consideration when constructing such a plant, first the temperature of the distilling vapors, and then the temperature of the water to be used for condensation, you will be able to figure out very closely the length of the pipe needed and the efficiency of the condenser.

MR. TODD.—A condenser thirty inches long, such as is used by Prof. Remington, when placed in position in a distillery, can be used as well as in the laboratory, provided—and this is important to be considered—that you get a sufficient amount of water to do the work. I was greatly surprised at the efficiency of the condenser, and certainly the laboratory chemist could have nothing better than that form of condenser. It seems incredible that it can do such an amount of work, which ordinarily would require an apparatus of increased proportions. In correspondence with distillers who do not get from their stills the results that they expect, they have said, "I do not know why I do not get a sufficient amount of oil from the plant. I have been distilling gaultheria, and the pressure of steam is forty pounds in my boiler. It seems that that pressure is sufficient." But this fact is overlooked: it makes no difference what the pressure of the steam in the boiler is, whether it is four ounces or four hundred pounds; the pressure is taken off at a point between the distilling bath and the boiler where the valve is located, and even if the pressure is 400 pounds in the boiler, you have not got that pressure in the bath. In the distilling bath the temperature never varies two degrees from 100 degrees Centigrade. If you placed the pressure at 400 pounds, or even at 25 pounds, in your wooden vats, it would blow the vats to pieces. The temperature of the steam used in distilling is always the same. The remarks of Mr. Ebert regarding the careful consideration of the water used for condensation are extremely valuable. In the winter time it requires much less water than in the summer, and that is owing to the temperature of the atmosphere, which has a vast condensing effect upon a large condenser.

MR. HALLBERG.—I can hardly let this subject drop without making a few remarks upon a subject connected directly with it, and which I think would be of great interest to us as pharmacists in general and to the State of Michigan in particular. I am told that north from here, about two or three hundred miles away, hundreds and probably thousands of charcoal burners are at work, and that this charcoal burning is carried on in the old-fashioned way, all the vapor escaping and of course being lost, and nothing but the charcoal being obtained. A gentleman who is doing some work in that region said to me that he counted one hundred and sixty charcoal burners one day, distributed within a radius of a few miles. All the acetic acid is escaping and is lost, which otherwise could be saved; also all the wood alcohol. If there is any member here from the State Association familiar with this subject, I would like to ask him whether any steps have been taken towards perfecting the methods of producing charcoal, and obtaining these very valuable by-products in the state. I think Prof. Prescott might reply to this inquiry.

MR. PRESCOTT.—In order to utilize all these by-products, we must have an effective distillery apparatus, and must extend the knowledge and application of distillation, which appears to be not fully understood. I suppose some charcoal is burned without the saving of the volatile products, but by no means all of it. The distillation of wood alcohol and the condensation of the vapors drawn by a fan to a receiver is carried on in very many places in the State of Michigan. A gentleman who conducts this distillation at many points and refines the products here in Detroit, has an exhibit in the exhibition room, which will be of interest to everybody. At a meeting in Cleveland recently, a very valuable paper was read upon the details of a method which was called the "American Method," and I refer to what may be called the "Michigan Method," because I suppose it to be carried on in Michigan more than anywhere else in the United States, for the distillation and condensation of volatile products. The paper will be published with drawings in the Proceedings of the American Science Association.

Mr. Prescott read the following paper:

ASSAYS OF POWDERED IPECACUANHA.

BY JOHN E. PENNINGTON.

The emetine was estimated in sixteen samples obtained in dispensing pharmacies in three towns in Michigan. The process was that of Dragendorff,* as modified by Lyons,†—a simple operation of extraction with water and alcohol, titration with Mayer's reagent, and corrections for dilution.

To 50 c. c. of distilled water in a suitable flask, 10 grams of the drug are added, and the mixture is set aside for twenty-four hours, with occasional shaking. Then 52 c. c. of alcohol of sp. gr. 0.82 are added, and the mixture set aside, with occasional shaking, for several days. Of the liquid (100 c. c. in all) 20 c. c. are now decanted, to represent 2 grams of drug, when 5 drops of a dilute sulphuric acid of six per cent. strength are added, the alcohol evaporated off at a gentle heat, and water added to bring the volume to 20 c. c. After digesting a few minutes on the water-bath, and cooling, the liquid, without filtering, is titrated with Mayer's solution, twentieth normal. At the end of the titration, for each c. c. of the entire liquid there should be deducted 0.0384 c. c. from the reading, and the remainder should be multiplied by the factor 0.012075, to give grams of emetine.

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*DRAGENDORFF and ZINOFFSKI, 1874:-"*Werthbestimmung starkwirkender Droguen,*" p. 36.

†A. B. LYONS, 1885: *Proc. Mich. State Phar. Asso.*, III. 185; *Am. Jour. Phar.*, *57*, 531. "Manual of Pharmaceutical Assaying," 1887, p. 108.

The drug was weighed air-dry. The following table gives the number of cubic centimeters of twentieth normal Mayer's reagent (6.775 gram mercuric chloride, 25.000 gram potassium iodide, per liter), and the number of grams of emetine indicated, in each case from 20 c. c. of the fluid, that is, from solution of 2 grams of ipecacuanha weighed.

No. of Sample.	C. C. of Liquid.	C. C. of Mayer's Reagent.	Grams of Emetine.	Per cent. of Emetine.
1	20	2.8	0.0245	1.22
2	20	2.9	0.0257	1.28
3	20	3 1	0.0282	1.41
4	20	3.2	0.0293	1.46
5	20	2.9	0.0257	1.28
6	20	2.8	0.0245	1.22
7	20	2.6	0.0233	1.16
8	20	2.9	0.0257	1.28
9	20	2.6	0.0233	1.16
10	20	3.0	0.0269	1.34
11	20	2.5	0.0209	1.04
12	20	2.8	0.0245	1.22
13	20	2.9	0.0257	1.28
14	20	2.8	0.0245	1.22
15	20	2.5	0.0209	1.04
16	20	2.9	0.0257	1.28
Average.				1.26

The yield, though from the air-dry drug, was lower than was anticipated.

University of Michigan, June, 1888.

Mr. Prescott —Mr. Pennington did his work in the Ann Arbor school, and I have confidence in the process; but I confess that these results are lower than I supposed they would be. The average results for powdered ipecacuanha are lower than the results of the average assays for the root of previous years. There may be a difference in the methods in use. Mr. Thompson, who is present, must have had a large experience with powdered ipecacuanha, and I would like to know what figures are obtained by their analysis. It is very desirable that we should know the average strength of standard drugs, especially of those containing alkaloids.

Mr. Thompson.—My experience shows fully double the amount of emetine. The results depend somewhat on the process, and the dilution of the liquid to be titrated makes a great difference. The highest results were obtained with average samples of the drug.

Mr. Prescott.—These samples were obtained from retail stores.

Mr. Oldberg.—Did Mr. Thompson's samples come from the market, or were they powdered by yourself?

Mr. Thompson.—They were powdered by ourselves.

MR. OLDBERG.—With the ligneous cord and bark?

MR. THOMPSON.—With the ligneous cord.

MR. OLDBERG.—In large manufactories the woody part is also powdered. I thought, perhaps, you had an arrangement by which the wood was not used, the result being so different.

MR. THOMPSON.—With the wood removed, the difference would be 25 per cent.

Mr. Stevens was requested to read the next paper:

PREPARATION OF MERCUROUS IODIDE.

BY EDWARD SOETJE.

QUERY NO. 20.—A practical formula is wanted for the preparation, economically, of pure mercurous iodide (yellow).

The great trouble I had in making a sample of this salt by the tedious, and I might say uncertain process of the United States Pharmacopœia, led me to investigate the question of an easier and better method of manufacture. That the United States Pharmacopœia method is tedious, any one who has tried it can testify. That the purity of the product is uncertain can be seen by the number of washings required. Washing with alcohol takes out the mercuric iodide, but as the iodine and mercury are present in nearly exact proportions to form mercurous iodide, it will be seen that for all the mercuric iodide formed a corresponding amount of metallic mercury is left; this cannot be washed out, and will remain as an impurity with any residual mercuric iodide.

As far as I can find, only four other methods of preparing this salt have ever been proposed: 1, by triturating mercuric iodide with the right proportion of mercury; 2, by precipitation of a double salt of sodium pyrophosphate and mercurous acetate with potassium iodide; 3, by treating calomel with potassium iodide; and 4, by double decomposition between mercurous nitrate and potassium iodide. The first process is open to the same objections as that of the United States Pharmacopœia. The second is hardly of practical value on account of the difficulty of making mercurous acetate and the increase in cost by use of the pyrophosphate, while nearly the same objections can be offered as to the fourth method. When made by the third method, the product is liable to contain calomel, and some mercuric iodide and metallic mercury may also be formed.

Method number 4, while having a few objections, seems to offer us a quick and certain process, giving a purer product than can be obtained by any other method unless it be number 2. One of the difficulties of this method is to make a pure mercurous nitrate. This I manage to do by the following process:

Mercurous nitrate; $Hg_2(NO_3)_2 2H_2O$; 559.4

Mercury	10 parts.
Nitric acid, U. S. P.	5 parts.
Water	4 parts.

Mix the water and acid and pour over the mercury. Set aside to react in the cold, shaking briskly from time to time to remove any coating of nitrate which may have formed around the globules of mercury. When the reaction has ceased, the crystals of mercurous nitrate are separated from the mother liquor, and any metallic mercury remaining, by pouring on a filter, through the bottom of which several small holes have been punctured. A second crop of crystals may be obtained by concentrating the mother liquor, or more nitric acid may be added to dissolve remaining mercury, if any. If the crystals are to be kept for any length of time, they should be washed on the filter with a small quantity of a mixture of water 100 parts and nitric acid 1 part. The crystals are then dried between bibulous papers without heat.

I made mercurous nitrate several times by this process, testing the product each time for mercuric salt by dissolving, precipitating as calomel with hydrochloric acid, filtering and treating the filtrate with hydrogen sulphide, which failed to give the slightest trace of precipitate. One sample was kept for over a month in a bottle without any attempt to exclude light, then tested as before, with the same result. From this it would seem that the salt can be made pure, and, by taking the ordinary precautions as to exclusion of air and light, be kept for use as required.

After the mercurous nitrate is made, the iodide can easily be prepared by the following formula:

Mercurous iodide; Hg_2I_2; 652.6.

Mercurous nitrate	10 parts.
Potassium iodide	6 parts.
Nitric acid.	
Water.	

Dissolve the mercurous nitrate in 400 parts of water containing 4 parts of nitric acid, and the potassium iodide in 400 parts pure water, both in the cold. Pour the solution of iodide slowly into that of the nitrate, stirring briskly; allow to stand for five minutes; if the precipitate has subsided, decant off most of the liquid and pour the precipitate into a filter with the remainder, wash the precipitate several times with the water, and dry at a temperature of not over 50° C., keeping from strong light as much as possible during the whole process. The product obtained by this method is of a bright yellow color, instead of a green.

C. H. Wood, F. C. S., in an article in the *American Journal of Pharmacy*, volume xi., page 337, gives the result of an analysis of a sample of green and a sample of yellow mercurous iodide, which proves that the yellow iodide is the purer by far, containing much less mercuric iodide and uncombined mercury than the green. My time being too limited, I did not try this experiment, but accepted the conclusions of this analyst, especially as they have been substantiated by others.

From an estimation of this salt, I obtained an average of 60.83 per cent. of mercury and 38.13 per cent. of iodine, the per cent. in the pure salt being 61.16 per cent. of mercury and 38.84 per cent, of iodine, a very little over 1 per cent. being unaccounted for in my estimation.

One gram of the salt being treated with 10 c.c. of alcohol, as directed by the Pharmacopœia, the alcohol dropped into the water gave no opalescence whatever, and 5 c.c. evaporated on a watch-glass left only a very small residue, which was not red. That very little mercuric iodide is formed is shown by testing the first filtrate with hydrogen sulphide, which gives a scarcely perceptible precipitate, and the mercuric salt, if present at all, would be in the filtrate, as it contains a slight excess of potassium iodide. As no mercuric iodide is formed, no metallic mercury can be left. The first washings of a sample made according to the Pharmacopœia gave a heavy precipitate with hydrogen sulphide. A sample of mercurous iodide made by the above process showed no change in color after standing three months in a bottle kept in a little wooden box, thus at least proving its stability for a time.

University of Michigan, June, 1888.

MR. PRESCOTT.—I think the success Mr. Soetje obtained depended entirely on the manner of making the mercurous nitrate, in regard to the dilution and the temperature. We know that all soluble mercurous salts have to be prepared with great care.

MR. REMINGTON.—There has been some controversy as to the proper color. The revisers of the British Pharmacopœia, on account of the uncertainty, concluded at the last revision to drop the green iodide of mercury. The United States Pharmacopœia at one time called it hydrargyri iodidum flavum, but in the last two revisions it has been termed viride, green. I was very much interested in the pharmaceutical discussions in London in reference to the proper color for mercurous iodide. Is it yellow or green? When it is green it seems to be due to metallic mercury present, the blue color of which in combination with the yellow makes it green.

MR. STEVENS—It is an easy matter to conform with either of these conclusions if some pains are taken. With a solution of certain strength you will produce green iodide, and if you reverse the operation you will get the yellow. It requires care in following out the process, still it can be done.

THE CHAIRMAN.—It was stated that a bottle was kept in a drawer, and the iodide remained unchanged; but however carelessly it was kept in the drawer, it was protected from the light, which would not have been excluded if the same had been exposed on a shelf.

MR. ECCLES.—The mercuric salt can be changed by heat from red to yellow.

MR. REMINGTON.—Is that not always done by the application of heat?

Mr. Eccles.—I am referring to the mercuric iodide, which will turn yellow by heating it.

The following paper was read:

ARSENIC IN THE MEDICINAL BISMUTH SALTS.

BY RICHARD E. HAWKES.

The quantity of arsenic in the subnitrate and subcarbonate of bismuth furnished in pharmacy has been reported upon by several analysts within the past few years.* The desire for increasing purity in bismuth preparations has led the writer to make estimation of the arsenic contained in a collection of samples of both of the pharmacopœial simple salts, as obtained from dispensing pharmacists here and there at different times. Seven samples of subnitrate of bismuth and seven samples of subcarbonate were taken.

The quantity of arsenic was determined by weight of the mirror of the reduced element, obtained under Marsh's plan, as used by Gautier,† and improved by Chittenden,‡ the details being fixed upon as follows: Five grammes of the bismuth salt, accurately weighed, were gradually treated with diluted sulphuric acid, in the case of the nitrate heating until all nitric acid was expelled, and the mixture diluted with water to 120 c. c. About 30 grammes of zinc were placed in a flat-bottomed generating flask of some 400 to 500 c. c. capacity. The rubber stopper of the flask admits a separatory funnel closed with stop-cock, and a connection with a drying tube filled with calcium chloride of neutral reaction, this joined by a flexible connection to the horizontal ignition-tube, of hard glass and about $\frac{3}{16}$ inch inner diameter for six or seven inches in length, then narrowed to about one-third its previous thickness for about two inches, and lastly bent at right angles to reach down into a short test-tube carrying 3 or 4 c. c. of silver nitrate solution. The ignition-tube is supported for four or five inches by a single wrap of wire gauze reaching within one-fourth of an inch of the narrowed part of the tube. The wire gauze is supported at its extremities, and a double or triple spread burner of the Bunsen lamp is placed beneath, so as to heat the whole of the wire gauze and preserve an even low red heat in the ignition-tube for three to five inches or throughout its wrapped portion. If the inner diameter of the ignition-tube be over four or five millimeters ($\frac{3}{16}$ inch) it should be heated to redness for more than three inches of its length, with a slow evolution of the gas. The length of the ignited portion of the tube is to be proportional to its width and to the rapidity of the stream of gas. But the reaction in the silver nitrate solution will reveal the escape from reduction of any weighable quantity of the arsenic.

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*Chittenden and Lambert, 1882: Am. Chem. Jour., 3, 398; Jour. Chem. Soc., 42, 573.

O. S. Ledman, 1883: Contributions Chem. Lab. Univ. Mich., 2, 61; The Physician and Surgeon, Ann Arbor, 5, 341.

D. L. Haigh, 1886: Proc. New York State Phar. Assoc., p. 203; Druggists' Circular, 30, 209; Proc. Am. Phar. Assoc., 34, 519.

S. L. Rambo, 1886: Am. Jour. Phar., 58, 592; Proc. Am. Phar. Assoc., 35, 230.

"Taylor's Treatise on Poisons," 1875, Phila., p. 470.

"Trials for Murder by Poisoning," 1883, London, p. 510.

"Wharton and Stillé's Med. Jurisprudence," II., 1884; Amory and Wood, pp. 283, 571.

†A. Gautier, 1876: Bull. Soc. Chim., [2] 24, 258.

‡Chittenden and Donaldson, 1880: Am. Chem. Jour., 2, 239.

Sufficient diluted sulphuric acid is introduced into the flask to clear out the air, the rate of transmission of gas being indicated by the bubbling in the silver solution, and as soon as the air is all out, the ignition-tube is heated to redness. Purity of the zinc and sulphuric acid having been previously determined, the prepared solution of bismuth sulphate is gradually introduced through the separatory funnel, with additional diluted sulphuric acid if need be to maintain a steady bubbling in the silver solution. If a mirror be obtained, at the close of the operation the section of tube containing the mirror is cut out, wiped clean, cooled to temperature of the balance, and weighed. The tube is heated over a smokeless flame until the arsenic is wholly expelled, then cooled, wiped again, and the empty tube weighed again.

In each of these tests the gas was passed through the heated tube for six hours. The zinc and sulphuric acid, in a trial for the same time, gave strictly negative results. With the selected samples of bismuth salts results were obtained as follows:

SUBCARBONATE OF BISMUTH.

No.	Taken.	Wt. of mirror.	Arsenious Acid.	Per cent.
1	5.000	0.0025	0.00330	0.0660
2	5.000	none.		
3	5.000	a trace.		
4	5.000	0.0001	0.00013	0.0026
5	5.000	0.0003	0.00040	0.0080
6	5.000	0.0005	0.00067	0.0133
7	5.000	0.0004	0.00053	0.0106

SUBNITRATE OF BISMUTH.

No.	Taken.	Wt. of mirror.	Arsenious Acid.	Per cent.
1	5.000	0.0005	0.00067	0.0133
2	5.000	none.		
3	5.000	a trace.		
4	5.000	0.0002	0.00027	0.0053
5	5.000	0.0005	0.00067	0.0133
6	5.000	0.0001	0.00013	0.0026
7	5.000	a trace.		

From the experiments of others upon the limit of recovery of arsenic, in its chemical separations,* it appears evident that the actual loss of arsenic, in working 5 grammes of material, should not have been at the very utmost over 0.00004 gramme, that is, the admissible error should not affect the tenths of milligram expressed in "weight of mirror." And in No. 2 subnitrate, and No. 2 subcarbonate, if arsenic were present it was in proportion not above about 0.002 per cent.; in No. 3 subcarbonate, and Nos. 3 and 7 subnitrate, not more than about 0.003 per cent.

Recounting the summarized results of the analysts cited at the beginning of this note, it appears that, of arsenious acid from bismuth subnitrate, Chittenden and L. obtained 0.013 per cent. in average of 14 samples; with 0.077 per cent. maximum; *traces* in two of the 14, and *none* in one of the same.

Ledman obtained 0.0028 per cent. average of 11 samples, with 0.0109 per cent. maximum, and *traces* only in six of the 11.

Haigh obtained 0.033 per cent. average of 5, with *trace* only in one of the same.

Rambo obtained presence of arsenic in two only of four samples under Fleitmann's test.

University of Michigan, School of Pharmacy, July, 1888.

MR. REMINGTON.—I believe the efficacy of bismuth, for instance, in dysentery and in similar bowel affections, and where there is inflammation of the mucous membrane, is largely due to the mechanical action of the substance and its insolubility, and that solutions of bismuth have been shown to be of little or no value in such cases. I think we have a somewhat analogous case in the difference between prepared chalk and precipitated chalk. A young man told me that his employer did not make chalk mixture by the officinal process but from precipitated chalk; though a little more expensive, he thought it made a handsomer product. In this way they get entirely away from the object of the preparation, for the difference between precipitated and prepared chalk is not a question of price at all, but is in the molecular structure of the two. If you look at precipitated chalk, you will see that it is composed of distinct granules indistinctly crystalline, but the prepared chalk is different. If you were to run your hand through precipitated chalk, very little would adhere to the fingers, but with prepared chalk it would be very different. I believe the effectiveness of some preparations is due to the molecular structure of the substance more than to its chemical composition, and that a clammy, sticky and adhesive powder, like prepared chalk, is a better preparation medicinally; hence I think the Pharmacopœia is right in adhering to prepared chalk and in not ordering the precipitated calcium carbonate. Now with regard to bismuth salts, I believe their active principle is arsenic, as far as the strictly medicinal effect is concerned, but it is the mechanical effect that makes bismuth salts valuable in most cases.

MRS. UPSON.—As a physician I have had occasion to use many bismuth preparations, and believe that their efficacy is owing to the bismuth and to the mechanical effect, as remarked by Prof. Remington, and that a good deal of the curative quality of bismuth salts is due to the arsenic present. We have in our State a medical law. A homœopath in practice there administered large doses of bismuth to a small child, and the child died;

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*"Control Analyses," Prescott, 1885: Proc. Am. Assoc. Adv. Sci., 34, 113; Chem. News, 53, 78, et. seq.

some one who thought he knew a great deal about medicine, told the family that there was always arsenic in bismuth, and that the bismuth had killed the child, and it created quite an excitement in the neighborhood.

Mr. Eccles.—As to this question about the chalk mixture, I do not know at present which is the most beneficial of the two calcium carbonates. But I thought that the logic was a little faulty when Prof. Remington spoke about the chalk clinging to the fingers, and that that quality ought to be the one most effective. But it seems that it is not, because it would produce a certain effect on wandering through the stomach before it went through the duodenum and reached the affected part in the intestines; its action would be very slow, and you would not be getting the mechanical effect in the intestines that you ought to get according to his theory. This theory and practice do not agree.

Mr. Remington.—Fortunately the practice agrees, and we will let the theory go.

Mr. James.—For the information of Prof. Remington, I would state that talc has proved itself very efficacious in a class of diseases which he spoke of, and some French physicians are giving it in large doses, especially in diarrhœa and dysentery; its effect depends purely on its mechanical action.

The last paper was read by Mr. Stevens.

LIMIT TESTS FOR CALCIUM TARTRATE IN CREAM OF TARTAR.

BY CHARLES V. BOETCHER.

It was undertaken (1) to subject the U. S. Ph. test of cream of tartar for calcium salt to trial, to find how close an indication it furnishes; (2) if possible to extend the same qualitative test for indications of a scale of percentages of calcium salt.

Pure potassium bitartrate was prepared by neutralizing one-half of a solution of pure tartaric acid with pure potassium hydrate, then adding the other half of the acid, and crystallizing. Pure calcium tartrate was made by precipitation, washing and drying. Mixtures of weighed quantities of the potassium bitartrate and the calcium tartrate were made with graded percentages of the latter, and as specified below.

The pharmacopœial test is given as follows: "If one gramme of bitartrate of potassium be digested with 5 c. c. of diluted acetic acid [of 6%] for half an hour, then diluted with distilled water to 500 c. c., and the solution agitated and filtered, and 25 c. c. of the filtrate treated with 5 c. c. of test-solution [1 to 20] of oxalate of ammonium, the liquid should not become cloudy in less than one minute, nor distinctly turbid in one and a half minutes (absence of more than six per cent. of calcium tartrate.)"

As to the accuracy and delicacy of the pharmacopœial test, it is to be said that the experiments made upon the mixtures of known composition supported the following conclusions: the test is not liable to be too severe, and the official interpretation of its result is correct to within a difference of one per cent. of the cream of tartar. That is, a cream of tartar with not above six per cent. of the calcium tartrate will not in any case be excluded by a true application of the test, while an article must have over seven per cent. of the impurity to be sure of exclusion. An article with eight per cent. of the lime salt would not fail of exclusion by any trusty operator.

In the adaptation of this test to obtain indications of the limits of percentage above and below six, the same intensity of the reaction was preserved as far as possible by grading the final dilution, after digesting with the acetic acid and before filtering. And with high percentages of the calcium salt, that is, in No. 4 and No. 5 of the table, this modification was made in the execution: after diluting with the distilled water the well-mixed liquid was set aside five minutes for subsiding of the undissolved lime salt, then enough of the solution decanted upon the filter to yield 150 to 200 c. c. of filtrate, portions of 25 c. c. of which were subjected to the test. And this modification is recommended whenever undissolved lime salt remains after digesting with acetic acid and diluting, thereby avoiding the clogging of the filter, and the prolonged action of the solvent during a delayed filtration.

The 25 c. c. were in each case treated with the oxalate in eight-inch test-tubes of about 35 c. c. capacity.

No.	Dilution.	Per cent. Calcium Tartrate.	Time of Cloudiness.	Distinct Turbidity.
1	100 c.c.	2	⅓ minute.	1 minute.
“	150 c.c.	2	2 minutes.	4 minutes.
“	200 c.c.	2	None in 5 minutes.	
2	200 c.c.	4	¾ minute.	1¼ minutes.
“	300 c.c.	4	1¼ minutes.	2 minutes.
“	400 c.c.	4	None in 3 minutes.	
3	500 c c.	6	1 minute.	1½ minutes.
“	600 c.c.	6	1½ minutes.	2 minutes.
“	700 c.c.	6	2½ minutes.	3–5 minutes.
4	600 c.c.	8	⅔ minute.	1¼ minutes.
“	700 c.c.	8	1½ minutes.	2 minutes.
“	800 c.c.	8	2 minutes.	3 minutes.
5	700 c.c.	10	½ minute.	1 minute.
“	800 c.c.	10	1 minute.	2 minutes.
“	1000 c.c.	10	1½ minutes.	2½ minutes.

School of Pharmacy of the University of Michigan, June, 1888.

Mr. Prescott.—By a careful application of the pharmacopœial test, six per cent. of calcium tartrate cannot be distinctly shown, but cream of tartar containing eight per cent. would be ruled out by the test. The test may be extended to various degrees of dilution, according to the statement made in the paper. Whether any better limit of test will be found must remain for further investigation, but it seems desirable that the value of the present pharmacopœial tests should be known. The author of this paper, although there is no report made upon it, examined quite a large number of samples of cream of tartar from druggists and grocers, and in but few cases did he find those obtained from dispensing pharmacies to fail to be justified by the pharmacopœial test. In very few cases was there over six per cent. of the calcium salt, and from seven to eight per cent. I believe was about the maximum of that obtained from the drug stores. But the character and quality of the cream-tartar found in the groceries was perfectly astonishing; it has been found bad before, but never so bad as at this time.

Mr. Remington.—Terra alba?

Mr. Prescott.—Terra alba, alum and various other things: I do not remember now all the adulterants of the grocers' samples. I do not think over thirty or forty per cent. were of good quality.

Mr. Eccles.—Are the druggists really doing their duty by the public at large in not having some of the grocers' cream tartar analyzed?

Mr. Sloan.—Is it possible that the cream tartar used for baking and the resulting compound salt is really the source of a great deal of the widely-spread stomach disturbances, as known by our prescriptions? Almost one-half of the troubles of the stomach and bowels is probably from the alum powder that is sold in cream of tartar and from its decomposition in the bread in the stomach. Again, is it not possible that the alumina would be formed into soluble salts again, having the peculiar constricting action on the blood-vessels and upon the intestines? Might not that be the cause of a good deal of the disturbance? I know that this is not a question for this Association to discuss; it is a therapeutic question; but still it is an incidental one, and I would like to hear the opinion of some man more able to suggest the remedy.

Mr. Whelpley.—I would like to say, Mr. Chairman, in answer to Mr. Sloan, that if the cream tartar sold in the grocery stores in the different parts of the country agrees with that which some of the young men have found in St. Louis, there cannot be very much comfort from it in the way of digestion. Some four hundred samples of cream tartar were taken from the grocery stores, and over thirty-five per cent. contained a large portion of starch. I do not think there would be very much injury from that. These examinations were made by the members of the St. Louis Club of Microscopists, who have examined also many samples from drug stores, and these were never found to be adulterated. Some samples contained sulphate of sodium as an adulteration.

Mr. Prescott.—Quite a number of samples of grocers' cream tartar contained from ten to fifteen per cent. of tartaric acid. The rest consisted of starch, terra alba, and alum.

Mr. Hallberg.—Was the brand known as "99%" included in the examination? There is a brand of cream tartar made now that is claimed to be almost, if not absolutely pure; I believe it is called "99% cream of tartar."

Mr. Prescott.—Yes, sir; and I think that these claims were generally verified, but I cannot say definitely.

Mr. Whelpley.—Mr. Chairman, a gentleman who is in a position to know about these things informed me some time ago that there was a so-called cream tartar on the market, sold at a low price, consisting of sulphate of sodium to give it a cathartic effect. To give it the same taste as cream tartar, tartaric acid is added.

Mr. Remington.—I would like to introduce to the members of this Section one of the oldest members of this Association, Mr. Samuel S. Garrigues, of Michigan, a life member of the Association. Dr. Garrigues has been greatly interested in the manufacture of salt. His name is a household word in Michigan in connection with investigations in that industry, and I take the liberty of introducing him at this time, for there are many members here who have not had the pleasure of knowing him. I would ask him, if willing, to give us a little talk upon salt and its method of production.

THE CHAIRMAN.—Speaking for the Association, I assure you we should be glad to hear from Dr. Garrigues. (Applause.)

MR. GARRIGUES.—I will make a few remarks with regard to the manufacture of salt. I would not like to detain you with a long description of my processes connected with the manufacture in this State, as they are quite numerous; but I would like to refer to one fact that Prof. Remington has spoken to me about, and that is the getting rid of the deliquescent condition of the salt. It is known that a large majority of these salts are made from brines that contain quite an excess of foreign chlorides. In the evaporation of salt this chloride adheres to the surface, and of course attracts a large percentage of moisture. I had occasion to investigate this matter for the purpose of making what they call dry salt. It is very desirable to have a salt free from this deliquescent quality. The idea struck me that by preparing a saturated solution of the salt I could wash the crystals of the salt with this solution, and owing to the very deliquescent nature of these chlorides, I could get rid of them in that way. The result was very satisfactory. I made a saturated solution of the common commercial salt, adding a small amount of carbonate of soda to obtain the solution perfectly neutral, and then passed it over the percolator. Owing to the great solubility of these chlorides, they were all readily carried off. With a very small amount of the solution I have purified an entire barrel of salt so as to remove the rough chlorides almost entirely, leaving only the perfectly pure salt. Anybody who wants to purify a barrel of salt can do it by making a few holes in the bottom of the barrel and taking out enough to make a saturated solution with a bucket of water, adding a little carbonate of soda so as to get rid of the rough chlorides by precipitation. By percolating this solution through you will get a barrel of very pure nice salt. Many have asked me about this, and it is a little singular that in this salt producing State we are still importing foreign salt, that is, salt free from this moisture. I think that if the druggists of the country would only tell their friends how easily a barrel of salt can be purified, it would be a great help to them; also in their own houses they can get good results in this way. We have three varieties of brine; one variety is quite dark, and those that come from the lower sandstone are largely charged with chlorides. Of course on evaporation and crystallization, the salt becomes more or less contaminated, and every barrel sold goes out with a certain percentage of these chlorides. Very recently they have reached what is called the rock-salt bottom of Michigan, which is 2,000 feet deep. You will probably have an opportunity of seeing these wells on your trip up the river. The solution is made by forcing down fresh water and then pumping the solution up. Of course this will give a different quality of brine. One of the former methods used in the works for purifying the salt was by washing the entire crystals with a solution of carbonate of soda, and using the solution as it came down. The trouble was that in that condition there was also a percentage of carbonate of magnesia formed—a really pure solution of salt was not obtained in this way. There is no trouble in making a pure solution of salt in the way described, and getting rid of all the chlorides.

THE CHAIRMAN.—Has any member anything to offer?

MR. MAISCH.—I desire to present a resolution before this Section. After the last annual meeting, the Chairman of this Section, T. Roberts Baker, appointed the Committee on Prize Essays. The report of that Committee has not made its appearance—why, I do not know. Having met the Chairman some three or four months ago, he told me that the report was either ready or was in the course of preparation. Since it has not arrived, I would make the motion that the report of the Committee on Prize Essays for the past year, if received, be referred to the Council. I think that is the proper disposition of it.

The motion was seconded and adopted.*

The officers elected for the ensuing year were then installed, the Chairman, Mr. Painter, the Secretary, Mr. Whelpley, also Mr. Eccles, as the third member of the Committee, expressing thanks and speaking of the importance of this Section for the work of the Association.

The Section then adjourned.

After adjournment, the Chairman appointed the following Committee on Prize Essays for the ensuing year: Joseph Remington, of Philadelphia, Chairman; John Calvert, of San Francisco; and Emil Scheffer, of Louisville.

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* The Committee was notified of this resolution September 27th.—*Permanent Secretary.*

MINUTES

OF THE

SECTION ON PHARMACEUTICAL EDUCATION.

Thursday Afternoon, September 6, 1888.

The Section was called to order by Chairman Judge, with H. M. Whelpley as secretary. The chair appointed a committee for the nomination of officers for the ensuing year, consisting of Messrs. Remington of Philadelphia, Brown of Leavenworth, and Fennel of Cincinnati.

The secretary stated that, in order to present suitable subjects for the action of this Section, letters had been addressed to about two hundred members who are in a position to judge of subjects worthy of consideration ; from the answers, many of which contained also arguments on the subjects suggested, the following questions had been taken :

Should applicants for registration who fail in a written examination be given a second trial in an oral examination ?

Should candidates for appointment on boards of pharmacy be examined by a committee appointed by the State Association ?

What constitutes a proper preliminary education for applicants for apprenticeship ?

What can be done to prevent an elderly person from becoming a pharmacist ?

Should not apprentices be registered and examined ? and should not the examination of qualified assistants be restricted to those who have been registered as apprentices for a certain length of time ?

What system of apprenticeship is best adapted to the drug business ?

Is it desirable that a plan be draughted for the guidance of preceptors in instructing their assistants in their daily duties in the pharmacy, in order that some uniformity in practice and treatment of the assistants may be instituted ? Will not this Section draw up such a plan and ask its adoption first by the members and then by the profession generally ?

Should not the diploma of a college of pharmacy in good standing be recognized by the State Boards of Pharmacy ?

Can or should the diplomas of colleges of pharmacy be sufficient evidence that the holder has the right or proper amount of practical experience in a drug store to entitle him to be regarded and treated as a competent clerk and dispenser ?

What is the value of the four years' practical experience as required for graduation by certain colleges of pharmacy ?

Should our colleges demand experience in a drug store as one of the requirements for graduation ? and if so, what should be the minimum amount ?

To what extent can the number of lecture hours be increased in colleges of pharmacy?

Should not the period of instruction be extended to three terms, probably as follows: First year, junior course; second year, practical course in chemistry; third year, senior course?

Is it desirable to require a thesis from each candidate for graduation in colleges of pharmacy? and if so, should they be rated in the final examination?

What should constitute a desirable thesis?

What education should be required of candidates for admission to colleges of pharmacy?

Should colleges of pharmacy admit to the senior class druggists who have had ten years' practical experience, if their knowledge be up to the average junior or first course students?

What field of work is there in the country for the pharmaceutical chemist who confines himself strictly to his profession?

On motion of Mr. Sheppard, seconded by Mr. Bedford, discussions were limited to three minutes for each speaker.

The Secretary presented several letters and papers received in answer to his circular letter to members and others, which on motion of Mr. Bedford were now read.

Mr. Eccles read the following:

H. M. WHELPLEY, PH.G.—*Dear Sir:*—Not being conversant with the ideas or designs of the officers of the Section on Pharm. Education of the American Pharmaceutical Association, it is difficult for me to offer suggestions upon topics for debate at the Detroit meeting.

A very important one is the undue prominence given in Colleges and Boards of Pharmacy to topics and facts that the examined persons will never be called upon to use in practical life. The evil permeates every department of study from Chemistry to Toxicology. Would it not be much better for them to know *actual shop facts* about Iodide of Potassium, Quinine, Morphine and Rochelle Salts in a thorough manner, than to gain a smattering of everything, from these to Aldehyde, Resorcin and Xylol? The test of true education is not a crammed memory containing a mass of useless lumber that never can be used. It is instead the intelligent appreciation of principles and laws, with a knowledge of the kind of data on which they are founded. Young men should be taught to depend upon books more and memory less for the doses and particulars of *rarely used* drugs and medicines. They should learn the way to discover where and how knowledge can be found, rather than make them imagine their heads contain it all. Our graduates are too self-confident where they should act with fear and trembling.

Professors should enforce facts about common things by repeated reiteration, and principles by successive illustration. Students should be required to know the facts in the former and the principles only in the latter. Should a hundred rare drugs be mentioned in making clear a principle, the student should only be expected to remember enough to show that he knows what was talked about, and the selection should be optional. Lectures should be more discursive than they are, so as to arouse and uphold interest in the listeners. To accomplish this, however, the discursiveness must be methodical and aim at enforcing important principles. Many lectures now given are soulless and wearying because the material presented is discrete and disjointed.

It may be that my ideas as here presented are not sufficiently lucid. Summed up in the simplest form, they call for *practical*, *every-day*, *store-useful* facts *drilled* into and *demanded* of all who would wield the pestle, and the confining of the ornamental and progressive part of their education to a keen, clear appreciation of leading laws, embracing principles and fairly established theories. The first part fits them for real work. The second is as "a well of water springing up into everlasting life." It creates dissatisfaction with present human attainments and spurs them on to original thought and work.

The majority of the very best pharmacists in America would be unable to pass many of the Board of Pharmacy and College examinations. The propounders of the questions could not themselves run the query gauntlet of their colleagues nine times out of ten. Something should be done to stop this. It is an outrage on common sense. They are making mental dyspeptics instead of educated men and women. They are robbing them of the fitness nature has endowed them with. They are teaching them to loathe study, and by making them imagine they know the doses of all dangerous remedies without asking that the contents of their memory should be confirmed, they tend to produce a lot of unconscious poisoners. I speak from experience.

It would be easy to extend these suggestions into other directions, but my time and your patience would be overtaxed.

Thanks for your Missouri programme. How can I get a knowledge of the recommendations made by President Gallagher? Yours truly, R. G. ECCLES.

The letter was, on motion of Mr. Sheppard, referred for publication.

MR. SHEPPARD.—I think fair criticism on one point in the paper might be, that a person reading it, might think the young men were not to learn the doses. Now, while I would object very strongly to making an effort to crowd their minds with mere book knowledge, I urge that they must become familiar with, and have as perfect a knowledge as possible, of the doses. That is one point in which our clerks cannot know too much.

THE CHAIRMAN.—Especially of the potent agents.

MR. SHEPPARD.—Especially of the potent agents. This of course has a special bearing on the prescription department.

MR. ECCLES.—The paper answers that itself; it simply recommends that you shall not store the student's mind with data that he won't use, and it insists upon his knowing the doses, and all those things that he is going to use every day. But it objects to storing his memory with matter that he will confound, and for which he should refer to books.

The Nominating Committee presented the following nominations for officers for the ensuing year: Prof. P. W. Bedford of New York, Chairman; Prof. L. E. Sayre of Kansas, Secretary; and Prof. E. L. Patch of Massachusetts, for the third member of the Committee on Pharmaceutical Education.

On motion of Mr. Remington, the Secretary was directed to cast a ballot in favor of the election of the nominees, and they were declared duly elected.

Mr. Sayre read the following paper:

THE IMPORTANCE OF A GOOD ENGLISH TRAINING AS A PART OF A PHARMACEUTICAL EDUCATION.

BY L. E. SAYRE.

For some years past there has been a great deal of discussion upon the subject of the preliminary education of pharmaceutical students. Out of this has grown some practical good. We will venture to say that there is no applicant in the country who will be admitted to a pharmaceutical course unless he could spell "cat," multiply 2 × 4, and write, legibly or otherwise, the capitals and small letters of the English alphabet.

It is not this low preliminary work that we wish to discuss in this paper, but such a systematic training in the English language as will give the student a knowledge of the same and facility in its use, at least equal to his knowledge of drugs and his ability to handle them. It is a deplorable fact that many a "pharmacist" might be able to pass an examination considerably harder than that amusingly above indicated, and yet be unable to make out an order for drugs that could not be misinterpreted, or write any ordinary business letter expressing clearly and correctly the ideas he desires to communicate.

The writer well remembers his misgivings when he first came to realize on reading the annual announcement of the college, that his graduation hinged partially upon writing an essay involving original work pertaining to pharmacy. His misgivings came not so much from the pharmaceutical knowledge to be obtained, as from the skill required in its expression (and not obtainable in that institution), which a training in English should give.

I appeal to the experience of nearly every one here present when I ask: Is not this a common failing among a large majority of students in our colleges of pharmacy? and do our colleges sufficiently realize that their requirements for these *are* beyond the power of these students, either from the deficiencies of the student at the time of entrance (of which the college takes no notice), or from a lack of instruction afterwards which the college does not supply?

In other words, do not our colleges require for graduation that which they do not supply and do not require as a condition for entrance? Now it is true that some students have cultivated a knowledge of English before entrance, and a few of them endeavor to advance afterward, as did the writer, under proper tutorage; and our colleges therefore can generally find some theses that will fairly bear public inspection as regards their English, or that can at least be understood. But it is also true that the same colleges accept many theses that cannot possibly be understood, unless interpreted by the professor under whose supervision the work was done. Hence it is that graduates in pharmacy, when they come to confront the duties of what they claim to be a profession, find themselves sadly deficient. They find there is something more needed to make them worthy of claiming a membership therein. They may not be at fault in certain scientific acquirements; they may be thoroughly competent to handle poisons and dispense medicine; but for all that, if they come to their senses, they must own that they are at least unworthy members of a profession, or their profession is not worthy of the name it claims.

The same may be said of students who are preparing for some other professions in other schools. Dr. Chas. H. May speaks of this matter especially strongly in regard to the graduates of some of our medical colleges. He says he has received letters from graduates in medicine in relation to instruction which (as the following show) betray the same deficiency: "I *except* (accept) your terms;" "I make you the following proposition: *me* to pay," etc.; "I have *did* more studying after graduation than ever before;" "Am much *oblidge;*" "Your *tearms.*" These graduates, he further states, were from reputable colleges.

Almost any secrètary of a pharmaceutical association or instructor in our colleges could furnish examples of defective English. Not to prolong this paper unnecessarily, the writer contents himself with the following examples taken at random from a paper prepared by a pharmaceutical graduate for presentation to one of our societies—and this graduate held a high school certificate, and spent one year in college before entering on his special course.

He introduces his theme on the incompatibility of two substances as follows:

"The subject * * * * has been a terror to the scientifical minds since it has been known to exist. There can be no dependence placed in it, as at any unsuspecting moment it explodes with the most intense violence; so readily are its elements to breaking up, that it leaves its operator in profound confusion, and often causing great damage."

And again, further on in this paper: "From the natural elements which these substances contain would lead one to believe there could be no such reaction take place. That was the conclusion I finally arrived at, after studying over the matter for some time, and I proved my opinions in the following manner."

Judging from the standpoint of the practical pharmacist, this young man's qualifications are above the average, and, but for this deficiency, he might soon become one of the shining lights in the profession.

We are doing our best to elevate the standard of our profession, and to make the other professions, as well as the community at large, recognize and respect us as such; now it seems to me that while an advance in scientific acquirements is desirable to this end, yet it is becoming more and more apparent that an equal recognition by this Section of the A. P. A. of the importance of English training in the curriculum of our schools, is even more desirable. It is not necessary here to enter at large upon the many ramifications of development which the study of English affords, beyond the present citations; suffice it to say, that we all recognize that any scientific acquirement is markedly one-sided, unless it is accompanied by this much of English; and an advance in the profession must necessarily be accompanied by an equal advance in knowledge and intellectual training which the study of English involves.

Naturally you will ask: How shall this desirable training be accomplished? In my judgment, by creating a chair of English in our schools, similar to that which is recognized in other technological schools. The professor in this department should, I think, have complete supervision of all written work done by the students, and should criticize it with reference to orthography, punctuation, clearness and correctness of expression, and written work should be largely increased.

University of Kansas.

MR. PRESCOTT.—I approve very heartily of the recommendations set forth in the paper. It has been my opinion for many years that the elements of a grammar school education, or I might say of a high school education, and the ability to write English with reasonable quickness, is really more important than all the rest. If any one wishes to enter into business or into a profession, ability to write English correctly should be an entrance requirement, and this should be subject to definite rules fully equal to the entrance requirements of our colleges. Anything short of that would hardly do. There is this disadvantage, that it is subject to the discretion of the examiner in a very great measure, and it is somewhat difficult for an examiner to mark upon with precision.

MR. PAINTER.—Mr. Chairman, mathematics certainly should be required as well as correct English, because so much of our professional life is really applied mathematics. If the standard is to be regulated by that of the high school or the grammar school, mathematics would seem to take a part in it. Those who could enter the high school are supposed to write correct English and have a certain knowledge of mathematics.

MR. PRESCOTT.—That matter has often been mentioned. I have found students, however, who wrote English correctly and had sufficient scholarship for pharmaceutical work, but had not mastered enough arithmetic; they had to learn it as they went along, and pick it up as men do in business. Since 1873 or 1874 we have had a schedule of studies at the Ann Arbor School of Pharmacy, and I think the action upon these requirements being subject to the judgment and discretion of the examiner is a serious one, but I can't agree that those who enter the high school are required to write English correctly. Those who leave the high school do not. I have received a letter of inquiry a few days ago containing this sentence: "I have went completely through the English of the high school."

THE CHAIRMAN.—Don't you find, Prof. Prescott, that after all the real value of an education is the mental training, and not the actual specific acquirement in any particular direction? The systematic training to consecutive thought is valuable.

MR. ECCLES.—Careful training in systematic logic, not as taught in the books, but the real practical methods of logic as taught in the mind itself, is the secret to solve the problem. A good writer is a man who uses his words logically. The words contain actually the ideas he wishes to convey, and neither more nor less. The same kind of training is that of mathematics; it only takes up a different department of the mind, and trains it to be logical and consecutive. This can only be accomplished by breaking off the methods that are usually pursued in our modern education. There is a strong tendency towards breaking away from the memorizing, that great foe of a logical mind, the system of cramming. I have seen and can put my finger when at home upon a number of persons who when young were taught the dictionary and were familiar with almost any word in the dictionary, and yet they cannot write a sentence correctly. The shades of meaning by which words run into each other have been lost with them by overtraining, and they can only use them according to the dictionary, and consequently can not convey an idea correctly. I have seen persons trained in mathematics, and if examined on algebra or arithmetic they would be found all right, but ask them to write a letter and they are lost; they can only pursue a course in which their memory has been trained. This is what I wish to bring out, and have done so in part in the letter which I have written, that the students should not be trained merely in memory.

MR. WHELPLEY.—I do not know that it is either necessary or worth while to add another word to the point that Dr. Eccles has made. I have noticed more than once students who would pass a fair examination in a text book, say arithmetic, and if given a pharmaceutical problem based on pharmaceutical operation, would be unable to demonstrate it. For instance, a student, a young man with much knowledge, could tell you very quickly how many sheep would be left in a pasture of two hundred if four per cent. jumped out, but would not be able to tell you how much quinine would be in a mixture of two hundred ounces of a four per cent. solution; that is simply an illustration of the point made by Dr. Eccles. But there is another point I have observed in St. Louis, and presume others have observed the same, and that is we have students, educated in other things, who are not sufficiently familiar with the English language to understand intelligently the lectures, though they are bright and intelligent persons, and would pass an excellent examination in their own language; and the same must apply also to their study at home of the text-books and in the store.

MR. REMINGTON.—Mr. Chairman, I have been very much interested in this discussion. I feel as if I could hardly keep still when this question of memorizing comes up, because I believe it to be the bane of education, and yet there seems to be very little relief from it in our methods of education. I am thoroughly in accord with what has been said at this session, but the problem which must confront every teacher and every Board of Trustees connected with a college is this: What is to be done with the young man who has brains but has very little education? The question of brains and the question of education we very frequently see on the opposite sides of the scale with regard to many of the schemes of preliminary examination. I have conversed with many professors on this subject, and have forced the admission that in many cases they would reject the very men who ought to be in the college, and let in the men not wanted. Young men having acquired an English education at the High School will find it no trouble to pass the examination; but when, as Prof. Whelpley has said, however thorough in other respects, they could not do a problem which is a fair test of their real mental calibre and ability, they are sadly deficient. Now the difficulty is, how to meet this question. We can easily say we will have preliminary examinations, and bring these men all up to a certain standard; but can we on the other hand adopt Prof. Sayre's idea, and establish professorships of the English language in the colleges of pharmacy? Think of it a few minutes; it must be involved with some difficulty, and I don't see how it can be done. It seems to me, gentlemen, that the preceptor when he takes an apprentice to learn the business, should never accept a boy until he has an English education; and when we once reach that point, I think that there will be no trouble about getting them in college.

MR. HALLBERG.—I believe fully one-half of the men engaged in the drug business cannot extend their education to a collegiate course. I do not know whether we have solved the problem, but during the last meeting of the Illinois Association we adopted a plan of preliminary education which I believe will go a great way towards ameliorating this evil. It is that the State Board of Pharmacy advise the registered pharmacists in the State that when choosing an apprentice he shall have made out a document properly attested by his parents or guardians, or the preceptor of the school, as to the educational standard he has arrived at, and that this document be forwarded to the

Board of Pharmacy to be examined and placed on file; after two years' time he may come before the Board as a candidate for examination for an assistant's certificate.

The value of this plan is its moral effect on the young men intending to go into the drug business; they will soon know that this is required of them by the Board of Pharmacy; and I believe that it will also have a good effect on the public. I would like to make the motion before this subject is passed over, that it is the sense of this Association that the colleges of pharmacy of the United States require a preliminary education at the earliest practicable time.

MR. SAYRE.—I am heartily in accord with that motion, yet it don't exactly cover the point. and is very indefinite as to the standard. As teachers we should urge the necessity of more practical examinations by papers written, and of more written examinations. I do not think one-half of our colleges require anything in the direction of English. If the person knows the fact, or solves the problem, that is all that is necessary, no matter whether he expresses it correctly or not, but there should be some attention to that matter. My method is to have a written examination at least every month, and then to criticize the papers in the best way I can. I do not consider myself as competent as a professor of the English language is; but at least one thesis should be written during the season, and it should be passed over to the professor of English, who, if there is any great defect, should see the young man and tell him that before he can graduate he must have a better education in English.

MR. FENNEL.—What direct connection has this Association with colleges of pharmacy? Can the Association dictate to colleges of pharmacy?

THE CHAIRMAN.—We can only recommend.

MR. FENNEL.—The Association can only recommend; that is my idea. I believe Prof. Remington some years ago recommended a method of preliminary examination by examining the students after attendance at a portion of the course; if they proved deficient after a certain period, the money was refunded, and they were told they had better go into some other business. No college can adopt a preliminary examination unless it shall be uniform in all colleges. The money consideration always stands first, and there are always smaller colleges that will make a pretense of preliminary examinations; therefore the method suggested by Prof. Remington I think may be taken up, and that will be a very proper way—more so than this one recommended in the resolution offered.

MR. CANNING.—I would like to ask Mr. Hallberg if there are any colleges of pharmacy that do not require some sort of a preliminary examination. If there are I do not know of them—thought that they all required some sort of a preliminary examination.

MR. HALLBERG.—I do not think that any in the west do, outside of the universities.

MR. FENNEL.—I will speak for Cincinnati, and say that we require a preliminary examination. A record is kept of the examination, and if the students cannot pass the examination their money is returned to them.

MR. EBERT.—The colleges of pharmacy in the United States are like other business enterprises to a great extent. They say a great deal on paper and make many promises, but whenever the money consideration comes in they will very likely be not very exacting. A number of colleges require a preliminary examination, and carry it out, and it results in the turning away of men who do not come up to their standard. Now the proper way, I think, to cover this ground, is to let the young men enter the college with the understanding that at the time of the examination they must come up to a certain requirement, and if they find that their education is deficient, they will make every effort to comply with the requirements. In one of the colleges of Chicago a plan of this kind had been adopted. It was a very excellent plan; whether it is carried out now or not, I cannot say. There was no preliminary examination for entrance, but when a young man came up to pass his junior examination, at the end of the term, he was required to pass a side examination; besides that, it was necessary that he should have had two years' experience in the drug business before he was passed into the senior course. Now this preliminary examination and all this discussion is very fine, but it will not be followed out in the colleges. Students in passing from the junior into the senior course should be required to pass the examination up to the standard, and at the same time have had some years' experience in the drug business. If they have been faithful, no doubt they will be qualified to go up.

MR. BROWN.—The department of pharmacy in the State of Kansas does require a standard. The standard is that the student shall be at least 16 years of age, shall have graduated at a state high school, and shall have studied Latin for one year. If he cannot produce his diploma from the high school, he is examined by the faculty of the university; and if he has not studied Latin he is sent probably into the Latin class, and he has to bring that study up, so that when the student graduates he is well prepared to discharge his duties. If there is any deficiency, it will not be on account of his preliminary education.

MR. DAY.—I would like to amend the motion that this section shall appoint a committee of three to determine the standard of examination for colleges of pharmacy.

THE CHAIRMAN.—You have heard the amendment. The motion is now formulated as follows:

Resolved, That a committee of three be appointed by the chair to determine the standard of preliminary examination to be recommended by this Association to the teaching colleges of pharmacy.

The motion as amended was accepted, and the question being on the amended resolution, it was unanimously adopted.*

The Secretary read a lengthy letter from Mr. E. Goodman, of Cincinnati, which, as stated by its writer, was not intended for publication.

The Secretary presented a paper by Professor E. S. Bastin, of the Chicago College of Pharmacy, which on motion of Mr. Remington was received, and after having been read by the Secretary, was referred for publication.

ON PHARMACEUTICAL EDUCATION.

BY E. S. BASTIN.

Mr. H. M. Whelpley, Secretary of the Section on Pharmaceutical Education, of the American Pharmaceutical Association, was so courteous as to ask me to suggest some topics worthy of the consideration of the Section at its coming meeting in Detroit. I replied that I had not the time to prepare a formal paper, but that I might jot down a few suggestions that might serve as pegs on which to hang discussion.

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* Chairman P. W. Bedford appointed this committee as follows: W. M. Searby, San Francisco, chairman; A. B. Stevens, Ann Arbor; and J. M. Maisch, Philadelphia.

Having been engaged in pharmaceutical instruction for a period of some twelve years, and having had under my instruction, all told, during that time, probably not less than 2000 students, I think I understand something of the qualifications and needs of the average student; and, having taken no little pains to acquaint myself with what is being done for him in the various colleges of pharmacy in the country, I feel I can speak with some confidence regarding needed changes in the systems of pharmaceutical education.

In the first place, pharmacy can never become one of the learned professions until the requirements for entering it are very considerably raised. No wide-awake teacher can help deploring the fact that in the majority of our colleges of pharmacy students are admitted to the courses of study without adequate preparation. In many cases they are admitted without either examination or the very moderate requirement of a certificate from their teachers that they have successfully passed in the ordinary branches of study taught in the grammar school course. The consequence is that many of the students admitted are entirely unfitted to grapple with such subjects as botany, physics, chemistry, and many of the branches of pharmacy. So far as my own observation goes, and I have reason to bebelieve that mine is not exceptional in that respect, not one-fifth of the applicants for matriculation have ever pursued a high-school course, not more than one-tenth are high-school graduates, and probably not more than one in fifty are college graduates, and certainly a very considerable percentage of applicants have not even a good knowledge of the three R's. Yet it is the rarest occurrence that an applicant is rejected on the ground of lack of preliminary education. There are, it is true, a few colleges of pharmacy, mainly those that are departments of the greater universities, and not merely show-appendages to them, where the requirements for admission to a pharmaceutical course are something near what they should be; but these are the exceptions, and institutions that make these requirements are not well attended, for the obvious reason that the average student is inclined to go where he can "get through" easiest. He is fully satisfied with an "education" that enables him to pass the State Board, or that affords him a parchment passport whereby he may get by that august body without the inconvenience of an examination. The fact regarding the majority of our colleges is, that a very considerable proportion of the students admitted to the course are so poorly prepared for it, have so little mental discipline, so little ability to cope with the difficult subjects that are taught, that the course of study, so far as its results to the student and to the profession are concerned, is little short of a sham.

Moreover, colleges of pharmacy are rapidly increasing in number, and there is among them an increasing competition to obtain students, few of them being endowed so as to be self-sustaining without the income from tuition, and there is, therefore, every temptation to admit students that are unprepared, and to graduate as large a number as possible without reference to competency. The present system is in danger of breeding such quack-mills as have so long disgraced the medical profession in this country, unless something is done to stem the tide.

The situation is still further aggravated by the character of the instruction given in a very considerable proportion of our colleges. Most still cling tenaciously to the lecture system, which for the class of undisciplined or half disciplined minds that are obliged to receive that kind of instruction. is the very worst that could be devised. Lessing says, "Knowledge cannot be poured into the head as gold into a sack." All who have made the methods for imparting knowledge a study, know that to make the student a passive recipient of facts, or, as too often happens, of mere words that have little or no meaning to him, is to repress intellect rather than to develop it. The student learns in proportion to the effort he himself puts forth, and no system of education is anything but pernicious that makes of him a mere passive recipient or an idle listener. Yet this is undoubtedly the tendency of the lecture system. If any lecturer doubts this let him, the day after he has delivered one of his most brilliant lectures, sharply question the students regarding the subject matter of it. He will be astonished and ashamed to find how his facts have been perverted or forgotten, and how little the principles which he took the utmost pains to make clear have been comprehended.

Far better results will be obtained if the teacher will set the student a task from a text-book, and then by a lively and adroit system of questioning compel him to tell what he has learned, and demonstrate that he has comprehended the subject in all its bearings. The student is thus compelled to think, to get some grasp of principles, and facts which otherwise would be dry and uninteresting will be seen in their full significance, and will glow with interest; the faculties of the student will also be disciplined to methodical work, so that little as he will probably know of his profession when his short course of study is completed, he will at least have acquired the taste and ability to learn more without the aid of a teacher. Still better results will be obtained if, coupled with this method, the student is required to study systematically drugs and chemicals as well as books about them, to perform chemical experiments and analyses, and to go through with the various important processes of the pharmacy in a methodical and careful manner—to train hand, eye and brain together in well-conducted laboratories.

There are few of our colleges that do not require some laboratory work, but there is all too little of it even in the best. To say that no science can be properly taught without the aid of the laboratory—without the discipline to the observing and reasoning faculties which comes from well-conducted experimental work—is to repeat what has been insisted upon over and over again by the best authorities on education ; but how many of our colleges of pharmacy lay more stress on laboratory work than on lectures? How many still cling to methods of instruction that are not only antiquated, but demonstrably bad?

Again, the courses of study in most of our colleges are too short. Two brief terms of from twenty to thirty weeks each are all that is required in the majority of them, and in some, the second course consists in a substantial repetition of the lectures given in the first. True, most colleges, in addition to this, exact of the applicant for graduation three or four years' experience in a drug store before they honor him with a diploma, but it is safe to say that the "experience" acquired in many drug stores should be counted a positive damage rather than a benefit to the student.

Every one who knows much about the great sciences of physics, chemistry and botany, knows that even a good foundation for these sciences cannot be laid in the mind of the average student in the short time allotted to the whole course in pharmacy in most of our colleges. Much less can such a knowledge of them be communicated as will make the student in any sense a master of his profession.

If the profession is to be counted one of the learned professions, if pharmacy is to take rank with the legal, medical and engineering professions, if the practice of pharmacy is not to degenerate into mere shop-keeping on a par with the grocery and notion business, it is imperative that an increasing number of men should enter it who are scientifically equipped for it. It is time therefore that pharmaceutical education be placed upon a higher plane than it occupies at present.

How is this to be done? It seems to me it may be accomplished through the American Pharmaceutical Association, by stamping with their disapproval the superficial courses now too common, and by encouraging a united effort among the better colleges to raise the requirements for admission—to improve the quality and to extend the time of the courses of study. What should be the requirements for admission? I should say, at least a thorough knowledge of the branches ordinarily taught in a grammar school course, a knowledge of elementary physics, and a sufficient knowledge of Latin to understand its use in scientific nomenclature, to readily trace the meaning of words derived from Latin roots, to understand the modes of inflecting nouns, adjectives and verbs, and to translate simple Latin sentences. Without at least as much preliminary preparation as this, it is not possible for a student to pursue a course of study in pharmacy to advantage.

How long should a course in pharmacy be? I should say, it should consist of at least two terms of forty weeks each, corresponding to what is called the "school year" in most of our other educational institutions. This surely is too little rather than too much, though, to start with, it would probably not be wise to extend the time beyond this.

I do not think I am wrong in supposing that teachers of experience in colleges of pharmacy generally will agree with me in the main positions I have taken. I do not doubt they feel the need of these reforms, whatever they may think of the practicability of bringing them about. But with the great influence of your Association, cannot they be made practical? If an agreement could be brought about among six or eight of our leading colleges to adopt requirements for admission and for graduation something like those here outlined, and they were to pledge each other that they would stand by them, and if they were to have the backing of the Association, there could be no doubt of the success of the movement; all other colleges would soon be compelled to come to the same standard. Moreover, such a movement would have a wholesome influence on State Boards of Pharmacy.

Chicago College of Pharmacy, August 19, 1888.

PROF. SAYRE.—I know the time is very short indeed, but it does seem wrong to let a paper like this slip by without saying one word. I want to say that I have listened to that paper with a great deal of interest, and approving of its contents, I heartily grasp the hand of the author. I agree with everything that he has said.

A motion was made and adopted that the questions in the Secretary's report be referred to the next annual meeting.

Mr. Brown offered the following resolution:

Resolved, That the State Pharmaceutical Associations exercise great care and see that educated and competent pharmacists are selected for State Boards of Pharmacy.

On motion, this resolution was referred to the Section of Legislation.

Mr. P. W. Bedford was then introduced as the Chairman of the Section, and Mr. E. L. Sayre as the Secretary for the ensuing year, after which the Section adjourned.

MINUTES

OF THE

SECTION ON PHARMACEUTICAL LEGISLATION.

DETROIT, MICH., THURSDAY, SEPTEMBER 6, 1888.

The Section on Pharmaceutical Legislation, in the absence of the Chairman, R. F. Bryant, of Kansas, was called to order by the Secretary, William P. DeForest, of Brooklyn, N. Y., who asked for nominations for temporary Chairman. M. W. Alexander, the President of the Association, was on motion invited to the chair.

The Secretary stated there was no report of officers, owing to the absence of the Chairman, but suggested that C. W. Day, of Illinois, who last year had been appointed chairman of a committee to prepare a plan whereby interchange of certificates of Boards of Pharmacy could be made possible, might have a report to make.

MR. DAY.—I wrote to the secretaries of the different boards of pharmacy throughout the country, twenty-seven in number I believe, suggesting that it seemed desirable to many pharmacists that there should be an interchange of certificates between boards of pharmacy, and asking for the opinion of the boards and for suggestions as to the best plan for bringing it about. The matter has met with so little favor that I thought it would be better to still further discuss it or think it over, before presuming to make any report or outline any method. I therefore have no other report to make at this time. The boards of about half the states I think failed to answer me at all. Those in favor of an interchange of certificates seemed to be Nebraska, Georgia, the District of Columbia, Wisconsin, Minnesota, Pennsylvania, and the County of Kings, New York. Those opposed totally are New Jersey, New York state, and Wyoming. Iowa and Ohio claim they have no power to interchange, and New Hampshire, Missouri, and Virginia seemed to indicate that they would rather wait until the matter was further along before expressing any opinion on the subject. It seems to me that there can be no question but that an interchange of certificates is desirable, that it is coming, and that we will have it, perhaps in the near future; but just the best plan to bring it about is the question. It does seem to me that a standard should be adopted by the American Association, and then such states as saw fit to come to that standard might interchange with each other, and in that way it might be brought about to some extent, without waiting for all the states.

MR. KEPPLER.—I would like to ask the Secretary if he has received information of the passage of a pharmacy law in the state of Louisiana? I desire to announce to the

Section that such a law has been passed at the last session of the Legislature. We had made attempts during the last six years, and it gives me great pleasure to announce now that we have been successful.

MR. DEFOREST.—I have received no word concerning the passage of any law in any state. The compilation of pharmacy laws for reference is a part of the business of this commmittee, and presumably of the chairman of the committee.

MR. KEPPLER.—On behalf of the Pharmacy Board of the State of Louisiana, I would be very glad to receive information relative to the government of such boards.

MR. BUTLER.—Mr. Day did not refer to the reply he received from Massachusetts. I wrote him, concerning our position, that we have no power in the matter. The law prescribes what shall be done and what must not be done, consequently the board have nothing to say, and have no power to make any move in the matter.

THE CHAIRMAN.—I will say also in regard to Missouri, that while we have in certain cases interchanged certificates, yet the Secretary of State raised the question as to our right to do so. Our law clearly does not give us the power to do it. It does not say that we shall not do it; but it does not give us any power to grant such interchange. I wrote the Secretary to that effect, but I would like to see the law amended so that we might do it.

MR. SIMMON.—There was a conference of the secretaries of the different State boards, and the general idea seemed to be that an interchange of certificates would be proper. In quite a number of States the laws are in a shape so that the State boards could authorize such interchange. The matter was informally canvassed and the idea was generally expressed that it would be desirable that the American Pharmaceutical Association should take the matter in hand, and perhaps, through resolution or otherwise, request the different State organizations to confer on this point, and in cases where the laws prohibited an interchange of certificates, that they be amended in such a way that it can be done. I think there will be no trouble at all to have the laws amended in almost all cases; and with the exception of the two or three States mentioned by Mr. Day, that all the rest would be glad to have their State boards come into an arrangement of this kind. The State boards themselves would be willing to do so. The conference last evening requested me, if this matter came up, to ask the American Pharmaceutical Association to adopt a set of resolutions that would be a guide for the different States in an attempt to have a uniform system.

MR. HOLLISTER.—I think that under the Wisconsin law we are permitted to recognize the certificates of other states, but we have not done it. Wisconsin is ready at any time when the matter is properly promoted and put upon the right basis, to heartily cooperate in this regard. The Board and our State Association are quite united in that, and desire that there shall be established some standard national in its character, and yet of sufficient excellence, so that all the State Boards of the United States may unite in recognizing and securing an interchange of certificates. I myself think that it is only a question of time when it must and will be done.

MR. DEFOREST.—Mr. Chairman: I will state that the position of Kings county upon this question is entirely in favor of the interchange of certificates. We have hoped for it from the organization of the Board, and have always been willing to grant registration to those bringing certificates of qualification from another Board, always providing, of course, that the standard was as high as that of the Kings county Board. At the last meeting of the Board of Pharmacy, at the expiration of the term of office, I made that a large part of my report, taking strong ground in favor of the interchange of certificates, giving reasons why it was desirable; and my position was fully endorsed by the unanimous vote of the Board. We are ready at any time to receive the certificates of other Boards of Pharmacy, having a standard as high as our own. That is the only ground upon which certificates can be interchanged. We are ready to receive them under those circumstances, as soon as they are ready to receive ours. Of course if our certificates were not received in other places, necessarily we could not be expected to receive the certificates of such Boards.

I hold in my hand a telegram from our Chairman, saying: "Circumstances prevent my being with you. With best wishes for successful and interesting meeting.

"(Signed) W. F. BRYANT."

MR. SIMMON.—Mr. Chairman: I think it will voice the sentiments of those interested in this matter if I offer a resolution that the President of the American Pharmaceutical Association be requested to appoint a committee of five to formulate a plan for an interchange of certificates of the different Boards of Pharmacy upon some uniform basis. I think if this can be done here, it will give an incentive to the Associations to follow in the same line. A great many are willing to do so, but they say, and say correctly, that no two or three Associations can act independently of the others.

MR. PAINTER.—I offer an amendment, that the Chairman of this Section appoint that committee.

MR. SIMMON.—I accept that amendment.

MR. JAMIESON.—Mr. Chairman: It seems to me if the different Boards throughout the country would send to the Chairman of this Section sample copies of the questions and answers at their examinations, and if this committee that you are now about to appoint would go over them and establish the necessary grade for a Board to come up to, in order to be recognized by the other Boards, that would be a very simple way of getting at the matter. Let this committee pass upon the matter, and report those having the necessary requirements in the judgment of the committee. Let the committee also state that when the remainder will raise their standard to that point they will also be recognized. It seems to me it is necessary to act independently of the Boards themselves—that is, that the standard of excellence should be established outside of the different Boards. Illinois has one standard, Missouri another, Kansas another, and so on. Now if we can establish a standard from an entirely neutral point, such as this body would be, all coming up to that standard could be recognized. This is about the only way in which the object can be accomplished in my judgment.

MR. DAY.—I do not clearly see that the adoption of this resolution would put us in any better shape for next year than we are in already. It seems to me the only way to get at the matter is for the American Association to adopt a method and standard of examination for the State Boards of Pharmacy. It ought to be the standard of the American Pharmaceutical Association, and then as many of the Boards could come to it as deemed it proper. It must be the Association's own method. Furthermore, the number of members present here is not a representative number of this Association. I fear it would not be considered very authoritative any way—anything we might do here—because the number present is so small.

MR. CONRATH.—Mr. Chairman: It appears to me that before we get a uniform examination, we should have some uniformity in our laws, and that a committee should be appointed to examine every law in the United States with the object of securing uniformity. After we have that, we can get a uniform standard and system of examination. For instance, in our State the licentiates are required to have practical experience of five years. In adjoining States they are only required to have an experience of two years. There is a great difference right there. The Board in Wisconsin, where five years' experience is required, could not very well recognize the certificates of Illinois and Minnesota, where only two years' experience is necessary.

MR. JAMIESON.—It was just that point I was thinking of, and the questions and answers at the examinations in the different State Boards would be the best possible index to the standard of requirements of each Board. Let the committee pass upon the questions asked and the manner in which they are answered, and let the committee grade them. In that way some uniformity can be reached, or at least some idea can be gained of what is necessary in order to secure uniformity.

MR. SIMMON.—I would like to call Mr. Conrath's attention to the fact that the committee to be appointed will have to go to work very carefully; that there will be a good deal of work to be done; that the different laws will have to be examined, in order to work out a proper plan, and that this plan is to be submitted to the Association. The rest can then be done a great deal easier, under the auspices of the parent Association, than if two or three Boards were trying to make arrangements among themselves.

At the request of the Secretary, Mr. Simmon put the resolution in writing:

Resolved, That the Chairman of the Section on Legislation appoint a committee of five who shall draw up a general outline plan for the interchange of certificates of the different Boards of Pharmacy.

MR. SIMMON.—That is not very explicit, but it will be understood in view of the discussion here.

MR. DEFOREST.—As I understand, the committee will report next year, or it may be carried over a number of years until finally a plan is settled upon to the satisfaction of the Association or of this Section, and finally adopted. By that time we will have been educated up to the point that we all should be educated to, and will be ready for an interchange of certificates.

The resolution was adopted as read.*

The chair stated the next business to be the election of officers for the ensuing year.

Mr. Day thought there was no inducement for us to spend much labor on this Section when so few members attended. The Section on Education in the other room seemed to be drawing off our members; besides, he did not like to see this section put at the tail end of the Association, for it was as important as any of the others.

Mr. Hollister often thought it was a mistake to divide these Sections; they should meet together, as their work was similar.

Mr. C. S. Hallberg gave notice that he would move to amend the By-laws so that the two Sections would be merged together.

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* After adjournment, Mr. Day, Chairman of the Section for the ensuing year, appointed the committee as follows: Wm. P. DeForest, Brooklyn, N. Y., Chairman; George McDonald, Kalamazoo, Mich.; Chas. M. Ford, Denver, Col.; John A. Nipgen, Chillicothe, O.; Rob. O. Sweeny, St. Paul, Minn.—EDITOR.

Mr. Painter moved that this Section take a recess until after the Section on Pharmaceutical Education had adjourned. Carried.

About five o'clock the Section was reconvened. Mr. Alexander not being in the room, Mr. DeForest called the meeting to order, and asked for the appointment of a temporary chairman.

On motion, Mr. A. E. Ebert, of Chicago, was asked to assume the chair.

The minutes of the session before the recess were read, and a motion made that we go into election of officers for the ensuing year, which was carried, and resulted as follows: C. W. Day, Ill., as Chairman; J. N. Hurty, Ind., Secretary; R. J. Brown, Kans., third member—Messrs. A. E. Ebert and W. P. DeForest declining election as chairman and secretary.

A resolution was passed that the Legislative Section do not meet simultaneously with any other section.

Mr. Hallberg consented to withdraw his notice of amendment merging the two Sections into one.

A resolution referred to this Section by the Section on Pharmaceutical Education was offered by Mr. Brown, and duly seconded:

Resolved, That State Pharmaceutical Associations exercise great care in selecting competent and educated pharmacists for the State Boards of Pharmacy.

MR. CANNING.—Is there a provision in that resolution as to how the candidates are to be examined? I presume they would be examined by a committee of the State Association.

MR. BROWN.—This is merely a recommendation.

MR. DAY.—I do not think the resolution is complete.

MR. BROWN.—I offered the resolution for the purpose of having a recommendation from this Association, and I believe that something of that kind should be done. This resolution can be passed by the Association, and it is only binding on ourselves. The State Associations can act upon it if they desire; and if they do not, it amounts to nothing. I do not desire to bind the Association, but I think it perfectly proper that such a resolution should pass. It does not interfere with any State, and it certainly will do a certain amount of good. It is a personal resolution; it is in the interest of pharmacy in the State of Kansas.

MR. CANNING.—I think that Mr. Brown would be willing to accept an amendment. The resolution as presented seems to be in a crude state.

MR. BROWN.—This is merely a resolution making a recommendation. The State Associations can make their selections as they deem proper.

MR. DADD.—The gentlemen who are appointed are supposed to be men competent for the position, and they must be selected with that idea; at least, that is the usual method. Would it not be an imputation upon other Associations for us to pass a resolution of this kind? Would it not be an inference that they do not select their best men?

MR. BROWN.—I hardly agree with you. I feel that this is a necessity, and I ask you the question: Why is it that State Boards of Pharmacy are manipulated in the cause of politics? I do not believe that we can manage it, if it is mixed up with politics.

MR. JAMIESON.—The point that Mr. Brown makes is that the candidates to be appointed by the Governor shall have first shown their competency to act as examiners before they are named to the Governor, in those States where they are nominated by the the Association. It seems to me that State Associations may indicate a man's qualifications to go on the Board of Pharmacy, and that I understand is Mr. Brown's position. The State Association is much more competent to provide the means of determining a candidate's competency to act upon that Board. Suppose that Illinois chose to say that she would appoint a committee of five, before whom all who wish to become members of the Board shall appear and pass a satisfactory examination, and that of the successful candidates a certain number shall be recommended to the Governor. They would first possess the qualification established by the State Association before they are named to the Governor. The object of it is to have good men on the Board and those who are clearly competent to do the work. There should be a tribunal who would appoint say five good men to examine the members of the Board, and state clearly whether they were competent to do the work.

MR. REMINGTON.—The difficulty is, who is going to examine the five, and who is going to examine the other five?

MR. JAMIESON.—These men are usually selected by the Chair. He is the man who does that work.

MR. DEFOREST.—I move that this resolution be referred to the officers elect, to be acted on next year.

THE CHAIRMAN.—It is certainly in a very crude form, and the officers of this Section may put it into proper shape.

MR. BROWN.—Would it be out of order if I offered a motion like this? "*Resolved*, That the State Pharmaceutical Associations should exercise great discretion in their selection of parties to be named for selection as State Board examiners."

This resolution was seconded by several members, and agreed to.

The officers were then installed, and the Section adjourned.

WILLIAM P. DEFOREST, *Secretary*.

REPORT

ON THE

PROGRESS OF PHARMACY.

FROM JULY 1, 1887, TO JUNE 30, 1888.

BY C. LEWIS DIEHL.

It is coincident to this meeting that your reporter, though elected a member in Baltimore, in 1863, had opportunity for the first time to attend a meeting of the American Pharmaceutical Association, when, twenty-two years ago, the annual meeting was held in this city. He recalls with pleasure his bright anticipations of that meeting as he journeyed from Pittsburgh, via Cleveland, to Detroit, in company with Wm. Procter, Edward Parrish, Charles A. Heinitsh, John M. Maisch, Joel S. Orne, and others, remembering among the incidents how some of the party on the steamer from Cleveland were compelled to occupy rather narrow quarters in the state-room, which the purser was pleased to designate as the "Bridal Chamber." Then the pleasure incident to the meeting itself; of meeting for the first time associates that have become highly valued friends; of the delightful entertainment provided by the president-elect; and, after adjournment, of the interesting and instructive visit to Ann Arbor and the State University. The recollections of that meeting, in fact, afford your reporter abundant flood for retrospective review of the events, which pass before his mind's eye as in a kaleidoscope, that have characterized his connection with the Association. Alas! with the pleasurable recollections also come the painful ones of the loss of cherished friends made in the Association; and, though the remembrance of their virtues and attainments ever greens in our memory, quite a number who met with us twenty-two years ago are no longer of this life.

It is coincident to this meeting also, that at the meeting in 1866 your reporter was given opportunity to make his first report on the progress of pharmacy, having, very unexpectedly to him, been honored by being chosen chairman of the committee whose duty it was to prepare this report. The retrospect in this direction is also interesting, and possibly more pertinent to the objects of the present report. From a comparatively small volume the Proceedings have, in the course of the years that have elapsed since then, been enlarged to stately volumes, the reports on the progress of pharmacy alone filling a larger space of closely printed matter than did the entire volumes of that and of previous years. To the younger members in the Association it will be scarcely conceivable that "bromide of potassium" and "carbolic acid" had at that time been prominently used in medication only a few years; that "chloral" and "salicylic acid" were interesting cabinet specimens; while the "aniline" industry and the production of "artificial bases" were still in their infancy. Of mydriatic alkaloids, "atropine" was the sole representative, and that to a limited extent only. "Coca leaves" were known to pharmacists only by reputation, and though their characteristic alkaloid had been isolated and studied, its specially valuable properties as a local anæsthetic were only recognized very recently. The "artificial pyridine bases," now produced and so successfully used in medicine, were not even thought of, while anæsthetics were represented only by two substances—"chloroform" and "ether." In the domain of pharmacy proper, "fluid extracts" were only used to a limited extent; "elixirs" and "coated pills" were known only in a few examples; "tablet triturates" were unknown; and so numberless instances might be mentioned as illustrating the changes in pharmacy—for the better or worse, according to individual opinion—that have occurred since we last met in Detroit.

Since that time our National Pharmacopœia has been revised twice, and the time is near at hand for another revision of that standard, for which preparations are being made both by the Societies concerned in the revision and by the permanent Committee of Revision created in 1880. After the very thorough work accomplished by the last revision, it was thought that the labors of the next revisers might be considerably lightened. The work is however likely to be more arduous than ever, for the introduction of new remedial agents has so rapidly followed, the one upon the other, that it has been difficult for pharmacists to keep apace with them. For many of the newer remedial agents, particularly for galenical compounds, the "National Formulary" issued by this Association will afford to the Committee of Revision much material ready prepared for use or rejection. But the field extends equally over new chemical compounds, many of which have proven sufficiently useful to merit careful consideration in the next revision of the Pharmacopœia. In this place only a few of the chemical agents that have been discovered, or studied more correctly, and introduced into medicine since the last meeting in this city may be mentioned, viz: Pilocarpine, cocaine, eserine (or physostigmine), hyoscyamine, hyoscine, sparteine, gelseminine, and erythrophlœine; homatropine, chinoline, antipyrin, antifebrin (or acetanilid), antithermin, kairine, and thallin; saccharin, salicylic acid, salol, ararobin, and anthrarobin; iodoform, iodol, sozoiodol, urethane, hypnone, sulphonal, chloral, methylal, paraldehyd, methylene-choride, methyl and ethyliodide, and ethyl-bromide; pepsin, papayotin, pancreatin, and diastase; etc. etc. To enumerate only a portion of the crude drugs, products, and galenical preparations of recent introduction would lead to an endless list. Their multiplicity will be apparent on consulting the "National Formulary," which contains no less than 435 formulas and definitions of substances that have—perhaps wisely—been omitted from the Pharmacopœia, but are nevertheless prescribed with sufficient regularity to warrant their publication in the present form. That the necessity exists for extending the scope of our Pharmacopœia is well recognized by all pharmacists who are practically engaged in dispensing medicines; the degree and character of that extension will, it is to be hoped, receive that careful attention by the next Committee of Revision which the importance of the subject evidently demands.

The widening of the scope of Pharmacopœias is, however, not confined to the United States, as is evidenced by the action of pharmaceutical bodies abroad. Thus, the British Pharmaceutical Conference found it expedient, at its meeting in 1887, to adopt a series of formulas for unofficinal preparations, the demand for which is sufficiently frequent to warrant some authoritative method for their preparation. In comparison with the number of unofficinal preparations embraced by the "National Formulary," the number in the "British Formulary" is insignificant, being only thirty-seven, among which are three for "Elixirs;" three for "Fluid Extracts;" eight for "Syrups;" and fifteen for "Tinctures." While our British brethren are therefore to be congratulated that the practice of prescribing ex-official preparations is so limited as to justify the adoption of so small a number of formulas, the very fact of their adoption points out that there exist in British pharmacy conditions very closely akin to those existing in our own.

Similar conditions, also, are likely to affect the next revisions of the Pharmacopœias of continental Europe. Not to speak of France, which may be considered the mother of the pharmaceutical specialty business, conservative Germany is also drawn into line, and the indications are that the next Pharmacopœia of that empire will contain many innovations. The labors of the German Pharmacopœia Commission, to judge from the reports that have appeared at different times in the official organ—the Archiv der Pharmacie—promise to make the next issue a more comprehensive work than any of the previous Pharmacopœias of Germany. The formulas and definitions will not alone be thoroughly revised, but the remedial agents that have in recent years come to notice will be very completely represented in the work. To secure a more accurate revision and to avoid errors, as far as possible, of observation and of fact, loose sheets of the text intended for the revised work are supplied for criticism as supplements to the Archiv der Pharmacie, the first installment having been issued with the June number of this year. The new substances noticed in this issue are "saccharin," "salol," "antifebrin," and "wool-fat." Numerous papers bearing directly upon the revision of the Pharmacopœia have appeared in the German journals, and as criticisms of existing processes and definitions, will doubtless prove very useful to the Commission.

Some of the problems that will be encountered in the construction of future Pharmacopœias are outlined in the papers of Professor Lloyd—"A Problem in Pharmacy"--and of Professor Leech—"The Future of Pharmacy." Prof. Lloyd says that one of the problems in pharmacy has been the representation of the active principles of a crude drug as nearly as possible in a liquid or solid form; all of its characters, so far as the medicinal principles are concerned that give it therapeutic or physiological activities, are to be embodied therein. This aim is illustrated by the methods adopted in the making of most plant preparations, wherein the lines of substances, such as fluid, solid or dry extracts, tinctures, etc., are expressly designed to cover all the natural constituents. The ingenuity of pharmacists has been largely consumed in an endeavor to accomplish this object on the one hand, and on the other to isolate and prepare their most potent constituents for the purpose of more certain and accurate medication. Both views have their supporters, but the preponderance in recent years seems to be in favor of the aim to secure active principles of known purity rather than representative preparations of the entire drug. Prof. Lloyd, however, remonstrates against this tendency. He holds it as by no means established that, because a certain constituent of a drug has the power to manifest the most prominently active property of the drug, it should be used to the exclusion of other, though less active, constituents. There are many observations on record that point to the contrary, and one of the problems of pharmacy therefore consists in devising methods that will secure from the crude drug a representative of *all* the active constituents, excluding none, however insignificant its activity may appear; for, Prof. Lloyd says, "a still small voice" behind the whirlwind may be of greater value than the hurricane that exhibits itself in the prominent characters of some of our active drugs.

Professor Leech—whose remarks were addressed to British pharmacists —speaking from a medical point of view, observes that no one can watch the advances and alterations which are taking place in the theory and practice of medicine without being convinced that the work of the pharmacist, so far as it is influenced by its relation to medicine, will in time differ not a little from that which now devolves upon him. Until a few years ago the forms in which medicines were ordered differed but little from those in vogue in Sydenham's time. Great changes had indeed been made in methods of production, and preparations more convenient for dispensing had gradually been introduced; but the authors of our Pharmacopœias never considered it as part of their duty to search after methods by which the discomforts connected with the administration of medicines could be lessened. Practitioners generally did not take much heed of this subject, and pharmacists were content for the most part to do the best they could with the prescriptions of the doctors. But in recent times enterprising men have seen a want and hastened to fill it. Scientific pharmacists have invented better, or at least more convenient, prescriptions than those in the Pharmacopœia; they have invented, too, pleasanter forms of administration, and since the production of these new compounds on a large, is easier and cheaper than on a small scale, new commercial industries have arisen which have absorbed some of the work formerly done by individual pharmacists. There are good grounds for believing that the call on the part of the medical profession for these preparations and medicines is increasing, and will increase, and that this call will distinctly affect pharmacy. The new compounds are welcomed partly because of their convenience, partly because their uniformity of composition is, to a certain extent, guaranteed by the wholesale producer. At dispensaries students, with few exceptions, learn little or nothing, and even the opportunities for acquiring a knowledge of compounding drugs under practitioners who dispense their own medicines have somewhat diminished; for ready-made medicines are usurping the place of the official preparations which used to constitute the surgery stock. It is not likely that a return will be made to the old system under which medical students acquired a knowledge of pharmacy. If, then, the sole office of the pharmacist were to compound drugs, the future of pharmacy could not be regarded as satisfactory. In the end, however, the very increase of the wholesale production of compounded medicines as simple articles of commerce will not take from, but add to, the work of the future pharmacist, if he fulfils all the duties which seem to belong to his occupation. After reviewing the influences of the progress of our knowledge as to the chemistry and action of drugs, which point out that accurate medication is possible only by the administration of medicaments of definite composition—which those prepared under the older ideas did in most cases not attain—Prof. Leech concludes that "*If pharmacy is to hold its own, each pharmacist must be in the future the guarantor of the purities of the medicines he dispenses, not the mere distributor.*" The gain that will result from the acceptance of this position will, he believes, more than counterbalance the loss resulting from the transference to other hands of a certain portion of the work formerly devolving on them. Should this position be declined, it will be taken up by some other class, and with it may be transferred all the work which requires scientific training. In his opinion, the rise of pharmacy to a higher estate, or its fall to a lower, depends on whether what he calls its more scientific functions are accepted or declined.

Very pertinent to this subject are some papers and criticisms on the manufacture of fluid extracts by pharmacists. The growing tendency among pharmacists to discontinue the preparation of fluid extracts, as well as many other galenical preparations, and to purchase them ready-made, has elicited a paper by Mr. G. H. Chas. Klie, in which he shows that it is profitable to make fluid extracts, and that, leaving out of calculation the item of time as an element of expense, pharmacists can prepare fluid extracts much cheaper than they can purchase them from manufacturers, particularly if the process of repercolation is adopted. Mr. Klie's paper being addressed to drug clerks, he probably considered it sufficient to draw attention to the subject from an economic point of view. Commenting on this paper, the editor of "Pharm. Era," observes that the mere question of profit should not be the main argument in favor of the manufacture of galenical preparations by pharmacists. The main reason why the pharmacist should manufacture as many of his galenical and chemical preparations as he can conveniently and with a small margin of profit, is because in this way he keeps up in himself and his assistants an active interest in the progress of practical pharmacy in all its branches, and is enabled to appreciate at their true value the arguments presented by the agents of the various manufacturing firms who favor him with their periodical visitation. It cultivates moreover a sense of independence, which in these days of domination of monopolies is becoming yearly of greater importance. Continuing, it is argued by the editor that many pharmacists—perhaps the majority—cannot afford to devote any great amount of their time to work which yields so small a pecuniary return; that, therefore, it is economy for them to purchase, provided they are assured that what they buy is as good as what they could make themselves, and that there are specialties, coming within the legitimate field of trade, which will pay well for the time devoted to their manufacture. It is every man's duty to so use his time as to make it most profitable on the whole; and it may be a wise choice to devote an hour a day to manufacturing such products as fluid extracts at a profit which gives him ten cents an hour for his time, instead of using it in cultivating and extending the mercantile part of his business, with a certainty that the immediate money return will be much greater.

From the utilitarian standpoint this is about as much as can be said. But there is something beyond this that the editor of the "Pharm. Era" fails to present. The pharmacist is held responsible for the medicines he dispenses, whether these are prepared in his own or some one else's laboratory. In the case of medicines of accurately defined compositions—chemicals and the like—he has no difficulty to assume this responsibility, being perfectly able to identify their characters and conditions of purity by the tests laid down in the Pharmacopœia or in other works of authority. It is very different, however, in the case of galenical preparations, the heterogenous composition of which precludes other than superficial identification. Such goods must, therefore, at best, be purchased from that manufacturer in whose integrity and skill the pharmacist places the greatest reliance, and that, applied to the pharmacists as a whole, *means every manufacturer in this country;* for there is not one of these who has not his adherents, and in whom one or the other pharmacist has not paramount confidence. While, therefore, in emergencies, and to fulfil the requirements of special prescriptions, a pharmacist may be called upon to purchase fluid extracts and other galenical preparations, it is plainly *his duty* to prepare these in his own laboratory whenever it is possible, and more particularly those for which authoritative formulas are given, leaving out of question the item of cost entirely. And by conducting his business on this basis, the conscientious pharmacist cannot fail to make it remunerative to himself, as well as to do justice to his assistants and to the public whose interests he has elected to protect.

Another paper on this subject is that of Mr. J. C. Donaldson, who shows by figures that quite a number of preparations, particularly tinctures, elixirs, syrups, etc., can be easily and profitably prepared. He does not advocate the manufacture of fluid extracts, however, except those which admit of being prepared in quantities of five pounds or more. The author's remarks respecting the preparation of tinctures from fluid extracts—practiced and advocated by many—are significant. He says: "The extracts of different manufacturers differ greatly. Tinctures made from them generally prove anything but satisfactory to the physician using them. If you must use them, use only the best and most reliable makes. There is no economy in the practice." Precisely! And if the fluid extracts differ so greatly—as is admitted—why should not the pharmacist also embrace them among the articles of his own manufacture, and thus avoid the risk engendered by the practice of purchasing them; and if unsuitable for tinctures—presuming the practice of making them with fluid extracts of unexceptional quality to be permissible—why should they be suitable to dispense as fluid extracts?

The practice of dispensing other than officinally prepared medicaments when such are prescribed is quite as reprehensible as the substitution of one medicament for another, a practice with which pharmacists are sometimes charged. It is clearly a duty which the pharmacist owes to himself, to the physician, and to the patient—who is most concerned—that he shall compound a medicine with the most scrupulous fidelity to the prescription. One of the editors of the "American Druggist," referring to some remarks made by a contemporary journal respecting certain proceedings in the New York City courts against pharmacists who used Croton water in place of distilled water, called for in prescriptions, makes some timely observations respecting substitutions, however trifling they may appear. He says: "In connection with the question of substituting Croton for distilled water when the latter is prescribed, it is of no earthly importance to the pharmacist who desires to cultivate a prescription business, whether one is preferable to the other or not. The fact for him to keep in view is that he makes a business of preparing prescriptions according to the formulas furnished him, and is receiving remuneration for doing so." . . . "Our advice is to *use* distilled water when the prescription specifically calls for it, and be sure to use that which will bear the pharmacopœial test, and then get pay for the extra labor involved. This is business." . . . "There is little doubt that the majority of physicians might learn something from pharmacists who prepare their prescriptions; and in the case of choosing between distilled and filtered water, they might find, by a little attention to the matter, that the latter would answer as well for most purposes; but it is doubtful whether it would be politic for the pharmacist to volunteer the information, for it may be accepted as a rule that the greater the ignorance of the doctor respecting such matters, the more intolerant he is of criticism in regard to them."

If fidelity to the prescription of physicians was universal, there would be no occasion for such a charge concerning the practice of certain Berlin pharmacists as has recently been made in the German journals. It appears that a short time ago a German association set itself the task of proving that the German pharmacists habitually substituted one ingredient for another when not in stock. Accordingly bogus prescriptions were presented at the different pharmacies, calling for unknown and absurd articles. One of these was actually dispensed in fifty-eight Berlin pharmacies, while only twelve refused to compound them. The organs of German pharmacy admit the truth of the charge.

Under such conditions it cannot be wondered at that there should be disagreements between the physician and the pharmacist—disagreements for which unfortunately the pharmacist is alone to blame. The subject of the mutual relation of the two professions has, in fact, engaged attention, one might almost say, from time immemorial; yet the subject is apparently not exhausted, the grievances complained of being again and again discussed, with the result of occasionally presenting them in a new light, but generally reproducing that which is well known and recognized. So during the past year, also, a number of papers have appeared that are directed towards an adjustment of these grievances, a particularly large portion of them being in response to an invitation of the publishers of the "Pharmaceutical Era," who offered a competitive prize. Some forty or more papers were thus elicited, of which several have been published, the one by Prof. F. H. Gerrish, of Bowdoin Medical College, being awarded the prize. Prof. Gerrish regards the unsatisfactory relations of the two professions to be due to very simple causes, for which both may be held responsible. On the part of the pharmacist: the custom of prescribing, aggravated by a lack of proper qualification and education in medicine; the custom of renewing prescriptions without the sanction of the physician; the sale and its encouragement of so-called patent medicines. On the part of the physician: the custom of verbally directing the renewal of prescriptions; the demand at the spur of the moment of whimsical preparations, or for different brands of the same standard medicine; the habit of some physicians in localities in which pharmacists are accessible to furnish their patients with medicine. It is neither desirable nor necessary in this report to go over the entire ground covered by the different essays that have appeared, the more particularly since Prof. Gerrish's admirable essay in a simple and forcible manner covers the principal points of contention. It is clearly the duty of the pharmacist to restrict himself to the preparation, dispensing and sale of medicines, unless, being a physician by education, he also elects to practice medicine, in which event he must or should conform to the code of ethics of the medical profession. The renewal of prescriptions is an evil for which the physician is equally responsible with the pharmacist. The sale of patent medicines, while it cannot be avoided, need not be encouraged by the pharmacist. On the other hand, the physician should not whimsically designate the products of special manufacturers in his prescriptions; and he certainly should not supply the medicines needed in his prescriptions, if such can be filled in the locality in which he prescribes.

There are, of course, other grievances that might be mentioned; these are mostly of a minor character, and may with few exceptions be left to individual adjudication. But all that can be written upon the subject will be of no avail, unless some method is adopted, which, putting both professions on an equitable footing, will lead to a mutual understanding of the remedy that is necessary. Such a method appears to be that of Dr. E. Cutter, of New York, who proposes that a Section of Pharmacy be created in the American Medical Association, similar to the Section of Dentistry at the Ninth International Medical Congress—such a Section to be composed of, managed, and under the control of such bodies as the American Pharmaceutical Association, and be an autonomic department regulated by itself. Among the more important effects of such a Section mentioned by Dr. Cutter are these: that, besides conferring a social equality and standing on the pharmacists, it would throw them into professional contact with physicians pleasantly, and conferences could be had as to the desirable points to be made, with the result of tending to prevent each from trenching on the other's domain. Prof. Remington, who draws attention to this proposition of Dr. Cutter, observes that there can be no question about the desirability of making a strong effort to bring together the best elements of the professions of medicine and pharmacy, and that it is doubtful if a more opportune time than the present can be secured for the inauguration of a concerted movement looking toward this end. In addition to the advantages so clearly outlined by Dr. Cutter, he draws attention to the opportunity afforded by the establishment of such a Section for extended joint conference by physician and pharmacist upon the approaching revision of the U. S. Pharmacopœia. It is pleasant to note in this connection that relations tending in this direction have already been inaugurated between the Medical Society and Pharmaceutical Association of Pennsylvania, and will possibly take definite shape in the course of this year.

The professions of medicine and pharmacy are so intimately related that they cannot afford to quarrel. It is believed by your reporter that most of the grievances complained of are due to misunderstanding, aggravated in recent years by the rapid changes in both professions, and the fact that many of the older physicians and pharmacists are handicapped by preconceived ideas and confirmed habits. The younger generation of the members in both professions will easily accommodate themselves to the new order of things. They may elect to concentrate their efforts to the one profession or the other, or they may, as suggested by Dr. Charles L. Mitchell, elect to straddle both.

The report herewith submitted will, it is believed, fairly represent the facts relating to the progress of pharmacy since the date of the last report. It is a matter of regret to your reporter that the "Proceedings" of many of the State Pharmaceutical Associations fail to reach him in time for his report; and though the number that did reach him for the present report was larger than usual,* the greater portion of the matter relating to the transactions of the State Associations had in this instance also to be abstracted from reports given in the current pharmaceutical journals, and may therefore not be as correct as this portion of the report is designed to be.

Alabama Pharmaceutical Association.—The seventh annual meeting was held in Selma, May 8, 9 and 10, 1888. Members in attendance, a quorum. New members elected, 9. Present membership, 107.

Reports.—(1) By Board of Pharmacy. (2) Routine.

Papers.—(1) On Irish Moss as an Emulsifier. (2) Why Iodide of Potassium becomes Inert in the Stomach. (3) Why Gallic Acid is more Efficacious in some Forms of Disease than Tannic Acid.

The next meeting will be held at Birmingham, on the second Tuesday of May, 1889.

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* At the date of closing this portion of the report the "Proceedings" of the following State Associations have reached the reporter: Michigan, New Hampshire, Connecticut, New York, Pennsylvania, New Jersey, Kentucky, Florida, Alabama, Louisiana, and Virginia. Abstracts of the papers published in their "Proceedings" are embodied in this report under their proper headings.

Arkansas Pharmaceutical Association.—The sixth annual meeting was held in Little Rock, June 12, 13 and 14, 1888. Members in attendance, ——. New members elected, 39. Present membership, ——.

Reports.—(1) On Pharmacy Law. (2) Routine.

Resolutions.—(1) Objecting to the sale of "Bitters" and "Cordials" used as a beverage. (2) Recommending the restoration of the system of "Measures of Capacity," but also retaining "Parts by Weight," in the construction of all formulas for liquids at the next revision of the Pharmacopœia.

The next meeting will be held at Little Rock, in June, 1889.

California Pharmaceutical Society.—The eleventh annual meeting was held in San Francisco, November 10, 1887. It was proposed to hold a meeting in an interior town during May, 1888.

Connecticut Pharmaceutical Association.—The twelfth annual meeting was held in Willimantic, February 7 and 8, 1888. Members in attendance, 50. New members elected, 19. Present membership, 255.

Reports.—(1) On Unofficinal Formulæ. (2) On the Progress of Pharmacy. (3) On Trade Interest. (4) Routine.

Papers.—(1) A Speculation on Electricity and its Accepted Medium, Ether.

The next meeting will be held at Hartford.

Dakota Pharmaceutical Association.—The second annual meeting was held at Fargo, August 2 and 3, 1887. The present membership is 160. The next annual meeting will be held at Jamestown.

Delaware Pharmaceutical Society.—The ——— annual meeting was held in Wilmington, May 3, 1888. Members in attendance, ——. New members elected, 10. Present membership, ——.

The next meeting will be held at Wilmington, on the first Thursday of May, 1889.

Florida State Pharmaceutical Association.—The first annual meeting was held in Tallahassee, May 8 and 9, 1888. Members in attendance, 14. Present membership, 111.

Reports.—(1) On Legislation. (2) On Private Formulas, and Routine.

The next meeting will be held at the same time and place as that of the Florida State Medical Association.

Illinois Pharmaceutical Association.—The eighth annual meeting was held in Decatur, August 23, 24 and 25, 1887. Members in attendance ——. New members elected, 25. Present membership, 756.

Reports.—(1) On Liquor Licenses. (2) State Board of Pharmacy. (3) On Legislation. (4) On Unofficinal Formulæ. (5) Routine.

Papers.—(1) On Weights and Measures.

Discussions.—(1) The Pharmacy Law: (2) On Reorganization.

The next meeting will be held at Peoria on the third Tuesday of August, 1888.

Indiana Pharmaceutical Association.—The seventh annual meeting was held in Fort Wayne, June 6 and 7, 1888. Members in attendance ——. New members elected, 54. Present membership ——.

Reports.—(1) On Pharmacy Law. (2) Routine.

Papers.—(1 and 2) Random Notes. (3) What Fluid Extracts should be excluded from the Light. (4) Aqua Destillata. (5) Should the Proposed Pharmacy Law of Indiana recognize Diplomas from Colleges of Pharmacy. (6 and 7) On Syrup of Ipecac. (8) Should Yellow Wax be substituted for White in the officinal Cerate. (9) Distillation of Essential Oils. (10 and 11) On Calomel and Corrosive Sublimate. (12) Emulsions made with Dextrin. (13) On Oleate of Morphine.

The next meeting will be held at Indianapolis, the date to be named by the Executive Committee.

Iowa Pharmaceutical Association.—The ninth annual meeting was held in Des Moines, May 2 and 3, 1888. Members in attendance ——. New members elected, 38. Present membership ——.

Reports.—Routine.

Papers.—(1) On the Therapeutic Effect of Detannating Fluid Extracts. (2) On Mucilage of Acacia. (3) On Commercial Tincture of Chloride of Iron. (4 and 5) On Concentrated Nitrous Ether. (6) The Manufacture of Galenical Preparations from Fluid Extracts.

Discussions.—(1) The Abolition of the Tax on Alcohol. (2) The New State Liquor Law.

The next meeting will be held at Dubuque, on the first Wednesday of June, 1889.

Kansas Pharmaceutical Association.—The ninth annual meeting was held in Abilene, May 16 and 17, 1888. Members in attendance, ——. New members elected, 14. Present membership, 324.

Reports.—(1) On Trade Interests. (2) Routine.

Papers.—(1) Commercial Baking Powders. (2) The Prevention of Errors in Dispensing Poisons. (3) Compound Spirit of Lavender. (4) The Possible Presence of an Alkaloid in Astragalus Mollissimus. (5) Deviation from the Pharmacopœia. (6) The Metric System. (7) Excipients for Permanganate Pills. (8) Commercial Syrup of Ferrous Iodide. (9) Glycerin and Borax. (10) Cinchona Assays.

The next meeting will be held at Atchison, on the second Wednesday of June, 1889.

Kentucky Pharmaceutical Association.—The eleventh annual meeting was held in Henderson, May 9 and 10, 1888. Members in attendance, 30; new members elected, 82; present membership, 437.

Reports.—(1) On Liquor Law. (2) Routine.

Papers.—(1) O. W. L., etc.; (2) An Examination of Cream of Tartar. (3) Do Druggists Pay a Percentage to Doctors for Prescriptions. (Three other papers are mentioned in the minutes as having been read at this meeting, but they do not appear in the "Proceedings.")

The next meeting will be held at Crab Orchard Springs, on the third Wednesday of May, 1889.

Louisiana State Pharmaceutical Association.—The sixth annual meeting was held in New Orleans, May 8, 1888. Members in attendance, —; new members elected, —; present membership, —.

Reports.—Routine.

Papers.—(1) Preparation and Preservation of Hypodermic Solutions; (2 and 3) Morphiometric Assay of Opium: (4) Counter Prescribing (several papers).

The next annual meeting will be held at New Orleans, on the second Wednesday of April, 1889.

Massachusetts Pharmaceutical Association.—The seventh annual meeting was held in Boston, June 5 and 6, 1888. New members, 19. Present membership, 603.

Reports.—Trade Interests and Routine.

Papers.—(1) Liquor Legislation. (2) Can Mucilage of Acacia be made Permanent by the United States Pharmacopœia Process? (3) Has the Pharmacist the Moral Right to Sell Opiates Indiscriminately, even though he Comply with Existing Laws? (4) State Board of Pharmacy Examinations. (5) Investigation of Ingluvin. (6) An Incompatible Prescription. (7) Plasters. (8) Vanilla and Vanillin. (9) Extract of Vanilla. (10) Triturates. (11) Pharmacy Laws. (12) Internal Revenue and Temperance.

The next meeting will be held at New Bedford, in June, 1889, the date to be announced by the Executive Committee.

Michigan State Pharmaceutical Association.—The fifth annual meeting was held in Petosky, July 12, 13 and 14, 1887. New members elected, 50.

Reports.—Trade Interests, Unofficinal Formulas and Routine.

Papers.—(1) What Practical use can the Druggist make of the Microscope, and what is the Cost of such an Instrument as would Serve his Purpose? (2) By what method can Medicinal Phosphoric Acid be estimated Volumetrically? (3) Alkaloidal strength of Ipecac, and its Fluid Extract. (4) Proportion of Quinine contained in Commercial Citrate of Iron and Quinine. (5) Strength and Purity of Spirit of Nitrous Ether of the Market. (6) A quantitative determination of the Mineral Constituents of the Water of Lake Superior. (7) Chemical Analysis of Lappa. (8) Disinfectants and Antiseptic Preparations that can be made with advantage by Dispensing Pharmacists. (8) Effect of Temperature during the Titration necessary in Kerner's estimation of other Alkaloids with Quinine. (10) Causes of Variation in Color of Tincture of Opium. (11) Comparative Results obtained by different methods of Opium Assay. (12) Bibliography of the Opium Assay, and Dictionary of its Methods. (13) The Instruction in Practical Pharmacy, and Time for Study to which Drug Store Apprentices are entitled. (14) Under what conditions is Cocaine liable to Change into Amorphous Alkaloid? Is Hygriene a Definite Compound. (15) Strength of Spirit of Camphor used in Filling Prescriptions. (16) Relative merits of the methods of Weight and Measure for securing Preparations of Uniform Strength. (17) Morphine Strength of Tincture of Opium Dispensed in Michigan. (18) The Pharmacopœial Process for making Syrup of the Phosphates of Iron, Quinine and Strychnine. (19) Method of estimating the Quantity of Glycerin in Fluid Extracts, etc. (20) Copper in Solid and Fluid Extracts. (21) Quality of Cinchona Bark in the Retail Stores. (22) Analysis of Yerba Santa. (23) Examination of Vaselin and Petrolatum. (24) The Character and Growth of Pharmaceutical Literature. (25) United States Pharmacopœia Method of Assaying Opium. (26) Best Place for the Prescription Stand. (27) Examination of the Formulas of the several Dispensatories, given as equivalents for those of the United States Pharmacopœia.

The next meeting will be held in Detroit, simultaneously with the meeting of the Association.

Minnesota Pharmaceutical Association.—The fourth annual meeting was held in Stillwater, June 12 and 13, 1888. Present membership, 220.

Reports.—Routine.

Discussions.—Revenue Tax on Alcohol. Poison Law.

The next meeting will be held at St. Paul, June 11, 1889.

Missouri Pharmaceutical Association.—The tenth annual meeting was held at Pertle Springs, June 19, 20 and 21, 1888. New members elected, 132. Present membership, 953.

Reports.—Adulteration of Drugs. Trade Interests, and Routine.

Papers.—(1) Preliminary Education of Pharmacists. (2) Rudimentary Training in Pharmacy. (3) Druggists' Associations and their Benefits. (4) Turpentines, Officinal and Non-Officinal. (5) The Microscopy of the United States Pharmacopœia. (6) Some Observations on Precipitates. (7) Pharmacological Notes. (8) Uses of Paper Pulp in Pharmacy. (9) Oil of Citronella. (10) Notes of an Old-Time Druggist. (11) On Mineral Waters. (12) One Hundred Don'ts. (13) On Castor Oil. (14) Commercial Travelers.

The next meeting will be held at Pertle Springs, June 18, 1889.

Nebraska Pharmaceutical Association.—The seventh annual meeting was held in Lincoln, May 8, 9 and 10, 1888. New members elected, 47.

Reports.—The Establishment of a School of Pharmacy, and Routine.

Papers.—(1) On the Progress of Pharmacy. (2) On Apprentices.

The next meeting will be held at Lincoln, on the second Tuesday of May, 1889.

North Carolina Pharmaceutical Association.—The eighth annual meeting was held at Asheville, Aug. 4 and 5, 1887. The next meeting will be held at Goldsboro, Aug. 8, 1888.

New Hampshire Pharmaceutical Association.—The fourteenth annual meeting was held at Fabyan House, White Mountains, September 27 and 28, 1887. Members in attendance, 17. New members elected, 10. Present active membership, 85. Business of a routine character only was transacted.

Papers.—A few words on the Manufacture of Native Wines.

The time and place of the next meeting does not appear from the minutes.

New Jersey Pharmaceutical Association.—The eighteenth annual meeting was held in Morristown, May 23 and 24, 1888. Members in attendance, 17. New members elected, 65. Present membership, 325.

Reports.—Legislation, Trade Interests, Liquor Traffic, and Routine.

Papers.—(1) Dissertation on Botany. (2) Vehicles for Disguising the taste of Quinine. (3) Pharmaceutical Assaying. (4) Drugs. (5) Drugs sold in the State of New Jersey. (6) Estimation of Morphine in Opium. (7) Colorless Hydrastis. (8) Tinctura Moschi U. S. P. (9) Historical Review of the Laws Affecting the Sale of Medicine, etc., in New Jersey.

The next meeting will be held at Bridgeton, in May, 1889.

New York State Pharmaceutical Association.—The tenth annual meeting was held at Catskill, June 19, 20 and 21, 1888. Members in attendance, 70. New members elected, 68. Present membership, 853,

Reports.—On Adulterations, on Legislation, and Routine.

Papers.—(1) Flowers and their Winged Friends. (2) Homes of our South American Drugs. (3) Uncultivated Pharmacopœial Plants in the State of New York. (4) Pharmacopœial Assays. (5) The Treatment and Distillation of Peppermint Plants. (6) Old Solutions of Morphine Salts. (7) Spurious Glycerin. (8) Prizes for Papers on Pharmaceutical Subjects. (9) Postage Stamps, Telephones and Directories. (10) Conveniences that Pharmacists give the Public. (11) Elixir Phosphates of Iron, Quinine and Strychnine. (13) Is there a Need of Four Pharmacy Boards in our State? (13) Pharmaceutical Notes.

The next meeting will be held at Binghamton, at the call of the Executive Committee.

Ohio Pharmaceutical Association.—The tenth annual meeting was held in Columbus, June 12, 13, 14, and 15, 1888. New members elected, more than 50.

Reports.—Routine.

Papers.—(1) On Oil of Corn. (2) Powdered Extract of Nux Vomica. (3) Distilled Water. (4) Chlorine Water. (5) Test for Cotton-seed Oil in Olive Oil. (6) Dialyzed Iron of the Market. (7) Syrup of Lactophosphate of Lime.

The next meeting will be held at Mansfield, on the first Tuesday of June, 1889.

Pennsylvania Pharmaceutical Association.—The eleventh annual meeting was held in Titusville, June 12 and 13, 1888. Members in attendance, 55. New members elected, 48. Present membership, 680.

Reports.—On Adulterations, on Apprentices, and Routine.

Papers.—(1) The Genus Luffa. (2) Notes on Some Old Remedies. (3) The Best Preliminary Course for Young Men who expect to become Pharmacists. (4) Paris Green. (5) How to Promote more Fraternal Feeling in the Profession of Pharmacy. (6) A Concise History of Pharmacy, with Conspicuous Contrasts, Ancient and Modern. (7) Irish Moss in the Preparation of Emulsions. (8) Abstractum Jalapæ. (9) Pepsin. (10) Cream of Tartar. (11) Should Druggists Register as Physicians? (12) Reference Table of Doses.

The next meeting will be held at Scranton on the second Tuesday of June, 1889. Abstract of Proceedings.

South Dakota Pharmaceutical Association.—The second annual meeting was held at Sioux Falls, September 6 and 7, 1887. Members in attendance about 40.

Reports.—Routine.

Papers.—(1) On Weights and Measures. (2) To What Extent shall we Recommend and Sell Patent Medicines.

The next meeting will be held at Huron, August 21 and 22, 1888.

Tennessee Druggists' Association.—The ——— meeting was held in Chattanooga, May 2, 1888.

Reports.—Routine.

Papers.—(1) How Can the Science of Pharmacy be Advanced in this State? (2) How to Run a Drug Store Successfully.

The next meeting will be held at Memphis, on the second Wednesday of May, 1889.

Texas Pharmaceutical Association.—The —— annual meeting was held in Austin, June 12, 13, and 14, 1888.

Reports.—Routine.

Papers.—(1) On Loco Weed. (2) Various Matters of Interest to Pharmacists.

The next meeting will be held at Dallas, on the second Tuesday of May, 1889.

Virginia Pharmaceutical Association.—The seventh annual meeting was held in Danville, May 8 and 9, 1888. Members in attendance, 31. New members elected, 12. Present membership, 222.

Reports.—Routine.

Papers.—(1) Abuse of Opium. (2) Preservation of Essential Oils. (3) Hydronaphthol. (4) Peanut and Cotton-seed Oils. (5) Oxidation of Sulphurous Acid and Alkaline Sulphite. (6) Patent Medicines. (7) Deposit and Odor in Simple Syrup."

The next meeting will be held at Old Point Comfort, on the third Tuesday of June, 1889.

West Virginia Pharmaceutical Association.—The annual meeting was held in Clarksburg, June 20, 1888.

Reports.—Routine.

Papers.—(1) The Worries of the Retail Druggist: (2) Tinctures—Should they be Prepared from the Drug or from Fluid Extracts, and Why? (3) Why should the West Virginia State Pharmaceutical Association be Maintained.

The next meeting will be held ———

Wisconsin Pharmaceutical Association.—The eighth annual meeting was held at Milwaukee, August 9, 10 and 11, 1888. Members in attendance, —. New members elected, —. Present membership, 361.

Reports.—(1) Sixth Annual Report of the Wisconsin State Board of Pharmacy. (2) On Legislation. (3) On Revision of the United States Pharmacopœia. (4) On Internal Revenue Tax. (5) On School of Pharmacy. (6) On Adulterations.

Papers.—(1) In "Fluid Extract of Belladonna" is a Green Color to be Preferred, or a Dark? (2) Does the "Granulated Sugar" of the Market Meet the Requirements of Pharmacists? (3) On "Citrine Ointment." (4) Adulteration and Dementholization of "Oil of Peppermint." (5) On the Detection of Adulterations in "Essential Oils." (6) Sale by Manufacturers to Others than Jobbers. (7) Analyses of 1,000 Prescriptions (2 papers). (8 and 9) Papers by Professor Power.

The next annual meeting will be held at Palmyra.

PHARMACY.

A. Apparatus and Manipulations.

WEIGHTS, MEASURES, SPECIFIC GRAVITY.

Prescription Weights—Inaccuracy as in use in some drug stores.—Mr. C. L. Hackett has compared the weights in actual use in some drug stores with a standard set belonging to the State of Indiana, and gives the results in form of a table. Many of the weights were found inaccurate. Some were so corroded, or covered with dirt, as to be almost illegible; others were found so bright that it was evident that they had been cleaned by the use of chemicals.—Pharm. Era, Sept. 1887, 323; from Proc. Indiana Pharm. Assoc., 1887.

The United States Gallon.—A paper on this subject by Prof. W. P. Mason, and the comments thereon by the editor of the "Amer. Drugg." (Jan. 1888, 2 and 3), will be read with interest. It appears from this that there exists no *legally* defined standard of measure or relation between weight and measure in this country. In a report on "weights and measures," by the Secretary of the Treasury (Senate doc. 1857), it is stated that "The gallon is a vessel containing 58,372.2 grains (8.3389 pounds Avoirdupois) of the standard pound of distilled water, at the temperature of maximum density of water, the vessel being weighed in air in which the barometer is 30 inches, at 62°F." Inquiry from the Treasury Department, relative to some obscure points in this definition, elicited a reply from the office of the "Coast Survey," to the effect that a gallon is the measure of a *constant volume*, and that due allowance must be made for changes of temperature of a vessel used as a gallon measure. A subsequent letter from the Treasury Department states that "The value adopted by this office for the weight of 231 cubic inches of distilled water, at its maximum density, is 8.3389 lbs., or 8.3316 lbs. at 15° C. This reduced to 60° F. gives a value of 8.3312 lbs."

On further consulting the authorities, a very surprising degree of confusion was discovered. Accepting, therefore, the definition that the weight of a U. S. gallon is that of 231 cubic inches of pure water at 60° F., and weighed in dry air at 60° F., under a barometric pressure of 30 inches, the author made several calculations, according to which the weight of the U. S. gallon, under the conditions named, is as follows:

1st. 58334.68469367 grains, or 8.33352638481 pounds.

2d. 58334.946407143 grains, or 8.33356377249 pounds.

The editor of "Amer. Druggist" has also made a calculation which places the value in close conformity with Prof. Mason's second calculation, viz:

58335.21799875 grains, or 8.33360257 pounds.

There is evident necessity that the whole question of standards and relation of weight to measure be settled by law.

Dr. A. B. Lyons, referring to Prof. Mason's paper, observes that the most important result reached in that study was the discovery that Prof. Barnard's corrected value for the weight of a cubic inch of water is erroneous. He observes, further, that the original experiments were made in 1798, by Sir George Schuckburgh Evelyn, and Capt. Kater deduced from them the conclusion that a cubic inch of water at 62° F., barometer 30 inches, weighs 252.456 grains. Prof. Barnard verified this computation, but points out the circumstance that a slight error resulted in Capt. Kater's calculation from the assumption that the s. g. of air is $\frac{1}{834}$ that of water, whereas in reality it is $\frac{1000}{822164}$. Dr. Lyons concludes, however, that it is a waste of time to carry the calculations beyond one or two decimal places, until we are more certain of the infallibility of our premises. The experiments on which these conclusions hang were made nearly a century ago. It is hardly possible that they could have had the exactness that is now possible, with the improved mechanical appliances now in universal use. He expresses the opinion, also, that new and conclusive experiments should be made, properly by our government.—Amer. Drugg., March 1888, 41.

Parts by Weight—Question of Retention or Abandonment.—Mr. A. L. Beck, reviewing the discussion on the subject of the parts by weight, finds that there is less opposition to the method than is generally supposed. He is of the opinion that the wish to relapse into the "old way" comes from those, mainly, who are unwilling to give the method a fair trial, and for much of which the dispensatories and books of reference, giving definite quantities by weights and measures, are to blame. The author advocates the retention of parts by weight; but another step in advance might be to subjoin a "definite" formula in the metric system, requiring, if the Pharmacopœia is copyrighted, that quotations shall conform accurately to them.—Drugg. Circ., March 1888, 53.

Parts by Weight.—Mr. S. A. D. Sheppard writes in favor of the use of parts by weight in the construction of the pharmacopœial formulas. Having adopted the practice with the issue of the Pharmacopœia of 1880, he has had experience and speaks advisedly. He, as well as his assistants, like it better than any other system in use for pharmaceutical work, and he expresses the hope that the system will be continued in the Pharmacopœia. He appeals to pharmacists to give the system a fair trial before passing judgment. The older system of measures has become a habit with most pharmacists, hence the opposition in most cases. If the new system is used long enough to become a habit, the objection to it will doubtless vanish.—Pharm. Rec., Oct. 15, 1887, 322.

Parts by Weight—A Suggestion.—Mr. W. W. Kerr, while he expresses the opinion that much of the opposition to the present system of parts by weight is a correct measure of the indolence of the objectors, remarks that the fact cannot be ignored that this method of final adjustment of quantities is attended with more trouble than the old plan of weighing and measuring. One of the most formidable obstacles in the way of its universal adoption, is the difficulty of determining, in the case of liquids, the exact amount to be taken as the basis of calculation: a question involving spec. volume, which depends again upon sp. gr., and this is not always known. By way of a compromise with the inertia that pulls against the new system, the author suggests that it might be well for the revisers of the next edition of the Pharmacopœia to insert in that work a table of the weight in grains, say of one pint of each of the officinal liquid preparations. Pharm. Era, May 1888. 169.

Parts by Weight—Extent of the Employment of the Method in the U. S.—Mr. C. S. Hallberg, in order to determine approximately to what extent the "parts by weight" system is employed by druggists generally throughout the country, issued a circular letter, embracing suitable questions to be answered, to druggists in all the States. He has received replies from 154 localities, which are indicated in a table, and from which he deduces the following summary:

Parts by weight (are employed by)	12	per cent.
Dispensatory equivalents	10	"
Non-committal, but presumably employing equivalents	78	"
Opinion on substitution of parts by weight:		
Favorable	15	"
Favorable with compromise	9.5	"
Unfavorable	75·5	"
Opinion on retention	14.5	"
Favorable	2.	"
Metric system	18.5	"
Compromise plan	60.5	"
Unconditional abolition	5·	"
Indifferent.		

The author regards the above results to be, if anything, above the actual employment of the "parts by weight" system, from the fact that the reports are chiefly derived from young men at the close of a term of instruction especially devoted to facilitating the application of this system. West. Drugg., Feb. 1888, 48–50.

Specific Gravity of Liquids—Easy Method of Finding.—Mr. Alfred B. Taylor observes that a new application of an old rule has suggested a method of finding the specific gravity of liquids, which he has never seen mentioned, and which from its simplicity and great ease of application seems worthy of publication. By means of it the specific gravity of any liquid can be ascertained without calculation, or any apparatus other than a good balance and accurate weights.

It is known that the weight of a body is to its specific gravity, as its loss of weight when immersed in a liquid is to the specific gravity of that liquid; for example: 200 grains of citric acid (sp. gr. 1.60) lose in weight 115 grains when weighed in oil; and as 200 is to 1.60, so is 115 to .920, the sp. gr. of the oil. Now, if we make the weight of the citric acid the same number of grains as its specific gravity, our formula becomes—as 1.60 is to 1.60, so is the loss in weight of the citric acid when weighed in oil to the specific gravity of the oil; or, in other words, the loss of weight is equal to the specific gravity; from which we deduce the following general rule:

The specific gravity of a liquid is equal to the loss of weight (in grains) sustained by a solid body when immersed in the liquid, the weight of the solid being equal (in grains) to its specific gravity.

Hence it is necessary only to weigh the solid in the liquid, and its loss gives at once the specific gravity of the liquid.

Taking the preceding example: if 200 grains of citric acid lose 115 grains, 1.6 grain will lose .920 grain, and this loss is equal to the specific gravity of the oil.

As perhaps one of the most desirable solid bodies to use, the author suggests a piece of aluminium weighing 256 grains; the specific gravity of that metal being 2.56. If upon trial its specific gravity should vary from these figures, its weight should be made to correspond. Amer. Jour. Phar., Feb. 1888, 67–68.

Mr. Robert B. Warder, commenting upon the above paper, remarks that the essential point of the suggestion depends merely upon giving the bulb a certain volume, so that it will displace 100 grains of water, and that, while aluminium may be a suitable material for testing oils or other neutral fluids, glass would be more generally useful.—Pharm. Rec., March 1, 1888, 70.

In rejoinder, Mr. Taylor observes that while Mr. Warder's suggestion is true, the result cannot be accomplished in any other method as readily as by making the weight of the bulb equal in number of grains to its sp. gr.—Amer. Jour. Pharm., April 1888, 175.

PERCOLATION, EXTRACTION, ETC.

Percolation—Rate of Percolation of Buchu Leaves by Simple Percolation and by Re-percolation.—Mr. A. L. Beck has made some experiments respecting the relative value of the processes of simple percolation and re-percolation as applied to the extraction of buchu leaves. The results are given in the following table:

	Percolation.	By Re-percolation.			
	100 grams to ascertain amount of extraction.	Third Percolation. 473 grams.	Fourth Percolation. 473 grams.	Fifth Percolation. 473 grams.	Sixth Percolation. 473 grams.
1st Portion.	19.1 pr ct.	18.38 pr ct	19.87 pr ct	21.29 pr ct	20.25 pr ct
2d "	3.25 "	5.60 "	6.39 "	5.99 "	5.79 "
3d "	0.95 "	1.72 "	2.26 "	2.06 "	2.16 "
4th "	0.30 "	1.03 "	1.42 "	1.57 "	1.34 "
5th "	0.20 "	0.45 "	0.93 "	1.51 "	1.25 "
6th "	0.10 "	0.22 "	0.39 "	0.83 "	0.98 "
7th "				0.44 "	0.56 "
Total extract per ct. of drug.	23.90 "	27.40 "	31.26 "	33.69 "	32.33 "
Reserved extract.	19.10 "	18.38 "	19.87 "	21.29 "	20.25 "
Extract carried forward.	4.80 "	9.02 "	11.39 "	12.40 "	12.08 "
Actual extract obtained.		22.60 "	22.24 "	22.30 "	19.93 "

In the process of simple percolation the fractional portions were 100 c.c. from 100 grams of drug. In the process of re-percolation the portions of percolate were 473 c.c. each.

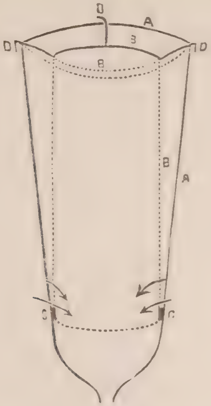
In the third, fourth and sixth percolations tall cylindrical percolators were used. In the fifth percolation an ordinary percolator was used, and when packed the drug was only about one-half as high as that in the tall ones, but it yielded much better results, giving a larger amount of extraction in the first, and less in succeeding portions; showing that the extraction was somewhat retarded by the longer column of drug it had to pass through in the tall ones.

In each case the percolation was about the same, being regulated by a rubber tube and adjustment of the height of the receiver.

The author believes that by using ordinary wide percolators throughout the series, the amount of extraction in the first or reserved portion would show better results and approximate the total extraction of the drug.—Amer. Jour Pharm., March 1888, 137–138.

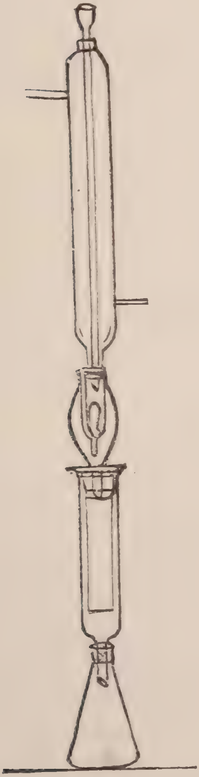
Macero-Percolator—A New Device for Combining Maceration with Percolation.—Mr. Adolph Reich describes a new device intended to combine maceration with percolation, for which he proposes the name "Macero-Percolator," (see Fig. 1.) The outer figure represents a glass percolator of any desirable size. The dotted lines *BB.* represent a perforated cylinder, which is held in position at *GG* by a wedge-shaped rubber ring, and rests at *DDD* on three or four pivots, the rubber ring being pulled over the bottom of the cylinder. In proceeding, the directions of the U. S. P. are followed. Enough menstruum is poured on the drug to saturate it and to leave a permanent stratum above. The maceration may be continued a day longer than usual. The liquid is then com-

FIG. 1.



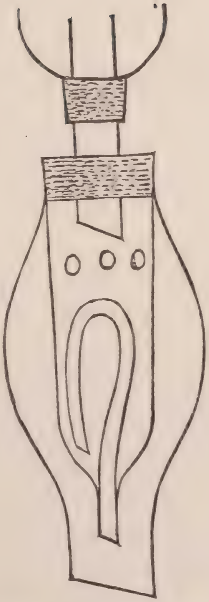
Macero-Percolator.

FIG. 2.



Giesler's Extraction Apparatus Complete.

FIG. 3.



Condenser Attachment.

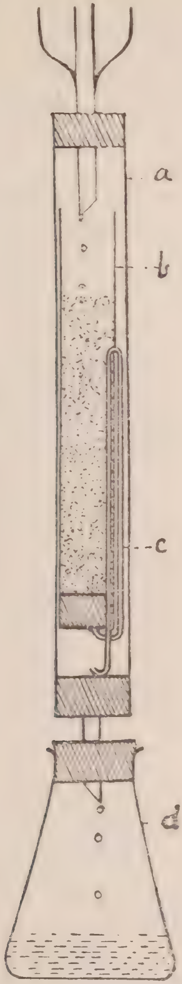
pletely withdrawn by percolation, and, if necessary, a fresh portion of menstruum poured on as before and again macerated, etc., until the drug is completely exhausted.—West. Drugg., July 1887, 226.

Extraction Apparatus—New Condenser Attachment.—Mr. Joseph F. Giesler has devised a new condenser attachment for the continuous extraction apparatus shown by Figs. 2 and 3. The condenser attachment consists of a bulb-shaped cylinder, about 2½ inches in diameter and 4 inches in length (exclusive of lower contracted portion to fit into the stopper of the percolator containing the extraction tube), into the neck of which a tube (1 inch in diameter), containing a syphon, is attached by fusion, as plainly shown by Fig. 2. This tube reaches well down into the cylinder and is perforated above the height of the syphon to admit the vapors into the condenser. The inner end of the syphon reaches very near to the bottom of the tube and then will thoroughly drain the same. The principal advantage of this attachment consists in that a certain portion of condensed menstruum will accumulate before the syphon-tube will act and empty the quantity accumulated. By this means, with a little care in regulating the rate of distillation, the substance can be extracted with successive small portions, the portion immediately on the substance having had time to disappear from the surface before the next portion flows in. The dimensions of the various parts of the apparatus are conveniently as follows:

1. A 6 ounce Erlenmeyer flask.
2. Extraction tube—1⅛ inches (internal diameter) by 5 inches in length.
3. Percolator—1½ inches (internal diameter) by 7 inches for body of cylinder.
4. Condenser attachment—as above, delivering 15 c.c. of solvent.
5. Liebig's condenser—15–16 inches total length; inner tube of 5/15 to ⅜ inch (internal diameter), lower end cut off obliquely.—Pharm. Era, April 1888, 124.

Simple Extraction Apparatus—Construction.—Mr. A. B. Stevens recommends the extraction apparatus shown by Fig. 4. The apparatus consists of two large tubes, *a* and *b*; *b* contains the substance to be extracted, and is placed inside of *a*. The vapor from *d* passes upward between the outside of *b* and the inside of *a*, thus heating the contents of *b*. If necessary, condensation in *a* may be prevented by wrapping a piece of cloth around the outside. The syphon tube is made by bending a piece of small glass tubing, its length to be determined by the amount of drug to be exhausted. The tube between the extraction apparatus and the flask should be sufficiently large to admit of the free passage of the percolate into the flask, and at the same time to allow the vapor to pass upward.—Pharm. Era, June 1888, 209.

FIG. 4.



Extraction Apparatus.

FILTRATION, ETC.

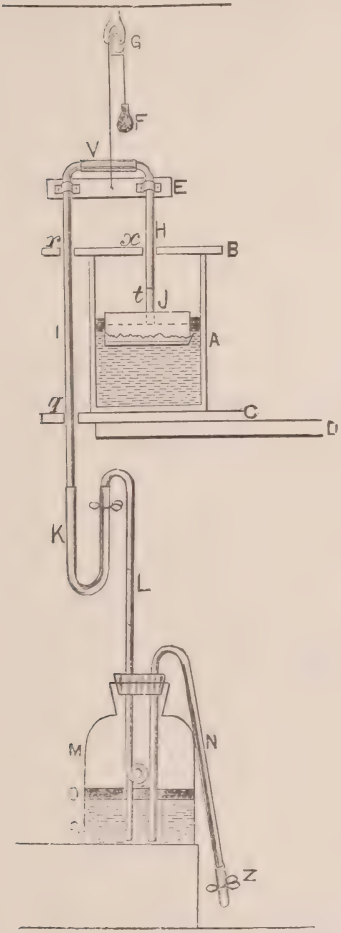
Filtration—Practical Notes.— Mr. E. Dieterich, whose experience as an enterprising manufacturer of pharmaceutical products lends special value to his advice upon subjects of a practical nature, makes some remarks on filtration, of which the following is a brief abstract: In order to obtain clear filrates, the filter should be moistened with the same liquid which is to be passed through—in the case of tinctures, with alcohol or dilute alcohol; for aqueous solution, with water, etc., etc. In filling up the filter (which must be pushed down in the funnel to the furthest point where it will lie flat), the liquid should be poured down the side. The author does not regard the use of vacuum pumps or aspirators with favor, as he finds that they soon become clogged with sediment. Besides, suction under a high vacuum usually produces a turbid filtrate. When a piece of filter paper is to be laid upon a muslin strainer, the paper should, before being wetted, be crumbled or crushed by the hand, so as to make it more readily adapt itself to the folds or curves of the muslin. Felt or flannel filtering bags do not usually filter clear at once, but require repeated passage of the liquid before they will do so. If no clear filtrate is obtainable in this way, the author advises the use of paper pulp as follows: Soak a sufficient quantity of filter paper in just enough cold water, and rub it to pulp. Then dilute it with hot water and pour some of the mass upon the walls of the filtering bag, which must previously have been wetted and pressed. The fabric eagerly seizes upon the water and the pulp remains adhering to the surface. The superfluous water is allowed to drip off, a funnel with wide tube is then inserted and the bag filled with the liquid. The author works by the plan described, using a half-woollen ordinary flannel, which is regarded merely as an exterior shell, the greatest care being bestowed upon the coating of paper-pulp. As to

Funnels.—The author remarks that, no matter whether a funnel has a large or small funnel-tube attached to it, it is always necessary to contract the orifice where the point of the filter rests, to prevent its bursting. In funnels with wide necks, this is best done with a wad of cotton or two. Funnels with ribbed walls are preferable. The walls should not be curved, but perfectly straight.—Amer. Drugg., June 1888; 112, from Pharm. Centralhalle.

Upward Filtration.—Mr. F. C. J. Bird describes an apparatus for upward filtration, which he has successfully used for the filtration of syrupy liquids containing fine suspended particles, and which it is desirable to protect from air. The apparatus is shown by figure 5.

A is a stoneware jar, of about two gallons capacity, placed on a shelf at a height of about five or six feet above the vessel *M*. It is secured to a board *C* of suitable dimensions, perforated by a circular hole *q*. *B* is of wood, three inches in width, and also perforated by two holes *x* and *r*. *C*, *A* and *B* are securely fastened together by string or other suitable means. *J* is the filter proper, and consists of a circular box, closed at the top and open at the bottom, and about ¾ in. less in diameter than *A*. *J* is divided at the center by a partition, which thus forms an air-tight chamber in the upper portion. The tube *t* passes through this chamber and communicates with the lower half of *A*, its upper end being connected to the glass tube *H* by rubber tubing. Over the open mouth of *J* is stretched the filtering medium, consisting of three layers, calico, paper and flannel, the latter being on the outside. *E* is a bar of wood to which the glass tubes *H* and *I* are firmly attached—*J*, *H*, *I*, *E*, form-

FIG. 5.



Apparatus for Upward Filtration.

ing a rigid system, partially counterbalanced at its center of gravity by the weight *F* through the cord and pulley *G*, the whole being capable of free motion up and down, so that *J* rises and falls with the liquid in the interior of *A*. The tubes *H* and *I* work through the holes *x*, *r* and *q*, which serve as guides. The weight *F* should be such that when *A* contains no liquid *J* just freely descends to the bottom of the jar. *K* is a piece of rubber tubing connecting *I* and *L*, so as to allow the free motion of *I*. *L* is a glass tube passing into the bottle *M* and twisted once as shown, near the bottom. A syphon and pinch-cock *N*, *L*, are required to draw the filtrate from *M*. If it is required to start filtration, *A* is filled with liquid, when by the buoyant action of the air chamber in *J*, aided by the weight *F*, the filter rises to the surface. A cork is inserted in the bottom of *L*, and the end of the rubber tube *V* removed from *I*. Through *V* and *I*, *I*, *K*, *L* and *H*, *J*, are filled with liquid (preferably bright). The connection at *V* is again made and secured, and a layer of colorless heavy petroleum oil about 1/3 inch in depth poured on the two surfaces *O*, *O*, of the liquids in *A* and *M*. As soon as the end of *L* is unclosed, filtration commences and goes on continuously. The oil is of course unnecessary in the case of liquids which do not suffer by exposure to air. All joints must be bound with waxed thread or wire, and thick india-rubber tubing used, to avoid collapse of the walls.—Pharm. Jour. and Trans., Feb. 25, 1888, 703–704.

Filtration—Use of Asbestos as a Medium.—According to Mr. W. Fresenius, viscid liquids, such as are obtained in processes of artificial digestion, may be filtered by the aid of finely picked asbestos fibre. To filter such a fluid the author advises its dilution with water, to add some freshly ignited asbestos, and to shake the mixture vigorously. After about twelve hours the suspended matter will have subsided, leaving the supernatant liquid perfectly clear. This is syphoned off and the residue washed once or twice by decantation, and then passed through a glass funnel, the neck of which contains a pellet of asbestos. If the first part of the filtrate runs off cloudy it is returned to the funnel until it passes clear.—Pharm. Era, May 1888, 181; from Ztschr. f. Anal. Chem.

A Quick Filter—Construction.—Mr. A. B. Clemence recommends the use of a combination of an ordinary filter with the point cut off and replaced by absorbent cotton, as a superior quick filter, especially in connection with the filter pump. It is constructed as follows: A three-inch filter pipe is folded as usual, and the apex cut off, leaving a hole about one eighth inch in diameter; a wad of absorbent cotton is pressed into the apex, and, when wet, may be, either with the pump or by the mouth, pressed tight enough to hold the residue. Even without the pump, this filter will run so fast that close watching will be needed to keep the funnel full.—Amer Drugg., April 1888, 66; from Jour. Anal. Chem.

Filter Paper—Presence af Gypsum.—Mr. Padé draws attention to an observation of 7 per cent. of gypsum in filtering papers, which, he thinks, is added with fraudulent intent. Of course, such a paper is unfit for analytical purposes.—Arch. d. Pharm., July 2, 1888, 647; from Jour. Pharm. Chim., 1887, 437.

Drying Frame for Funnels—Simple Construction.—Mr. Victor Meurer constructs an easily adjustable frame for holding funnels over a sand-bath as follows: Two glass rods are bent in the shape of a triangle, and two glass tubes are bent at each end under an angle of 90 degrees, which ends are slipped over the up-pointing ends of the triangles. A small glass rod, with in-turned ends, serves to prevent the parallel tubes from spreading. The funnels are simply placed in the rack, and the whole arrangement made of such size that it will go over a sand-bath.—Amer. Drugg., Jan. 1888, 5; from Zeitschr. f. Anal. Chem., 1887, 614.

Dialysis—Application for the Removal of Crystalloids from Syrups, Juices, etc.—Attention is drawn to what is called a "battery of dialysers," which has lately been introduced in Germany for the purification of syrups. It consists of a series of tall cylinders of fine wire gauze, open at the top end, but not at the bottom, which is rounded. This gauze is coated on both sides with layers of paper pulp, and the cylinders, arranged in regular series depending from a framework above, are plunged into the molasses, juices, or syrups to be purified, and are filled almost to the top with clear water, and allowed to "dialyse" for twelve hours or more. The water—into which a large proportion of the salts contained in the syrups, etc., together with traces only of saccharine matter, has permeated by "osmosis"—is then pumped away through pipes reaching to the bottom of each cylinder, and fresh water pumped in to take its place; this operation being repeated at intervals until the syrup, or whatever fluid may be treated, is considered purified.—Amer. Drugg., Jan. 1888, 2.

APPLICATION OF HEAT, ETC.

New Thermometer Scale.—Mr. J. Asher has devised a new thermometer scale, which is based upon the division of the space between absolute zero (—459.4 F.) and the freezing point of water into one-thousand degrees, which he calls milligrades. There are several points of advantage connected with this new scale, among which are the abolition of the minus mark, an absolute, not a conventional degree, and the relative smallness of the degree, which corresponds very closely to half a degree of the Fahrenheit scale (30–61).—Scient. Amer., Nov. 26, 1887, 337.

Rapid Evaporation.—Mr. J. W. Gunning describes a new method, employed in the Government laboratories of the Netherlands, for rapidly evaporating sugar solutions by means of heat applied over the *surface* of the liquid, instead of from the bottom, so as to avoid the spattering which is liable to take place when heat is applied in the usual manner. The method is applicable to all other non-inflammable solutions, when the object is to evaporate them rapidly, with a view to making a combustion. The apparatus consists of an iron plate standing on four legs, having four openings, one near each corner, through which the tubes of four Bunsen burners are adjusted at such height that their tops will be a little higher than the edge of the platinum capsules placed on the iron plate. A second iron plate is then adjusted over the burners. When the four flames are lit, the upper iron plate causes the flames to spread out along the plate, and both the direct flame as well as the radiation from the upper heated plate will cause a rapid evaporation of the liquid in the capsule.—Amer. Drugg., April 1888, 71; from Zeitsch. f. Anal. Chem., 1887, 726.

Concentration by Low Temperature.—Prof. J. U. Lloyd, referring to Noirot's method of making extract of coffee (which see under "Extracta") by freezing the infusion, etc., etc., makes some pertinent remarks upon the application of the method to the concentration of organic solutions in general. He has himself applied refrigeration (short of freezing, however,) in his attempts to isolate certain constituents of plants in an unchanged condition, and has reason to assume that, at some time in the future, less heroic chemistry and less heat evaporation will be employed in purifying many plant constituents, or separating these into natural sections, than is freely accepted now as a necessity. To show that the idea of concentration by cold is by no means a new one,* the author quotes a description by Col. James Smith, in 1799, of the method pursued by Indians in making maple syrup by freezing the juice of the sugar maple and rejecting the ice, thus producing a very acceptable syrup.—Amer. Drugg., May 1888, 81.

To Prevent Foaming.—It is stated that the best thing to prevent foaming in boiling liquids is to introduce a small fragment of paraffin, which will melt upon the surface, and, by its power of equalizing the surface and preventing the formation of waves, counteract the tendency to foam. Any other fat will serve the purpose.—Drugg. Circ., March 1888, 59.

Agent for Producing Instantaneous Cold.—Under the name of "Instantaneous Cold," a convenient substitute for outward application of ice is made by Baschlin. It consists of felting made from cotton, jute, cotton-waste, or China grass, saturated with a mixture of several salts (nitrate of ammonium, chloride of ammonium, nitrate of potassium, and sulphate of sodium), which, upon wetting with water, produces a low temperature.—Phar. Centralh., 1887, 532.

Distillation—Prevention of Bumping.—Mr. Markownikoff finds that in distilling under diminished pressure, bumping of the fluid is most effectually prevented by introducing into it a few capillary tubes of glass, made by drawing out a glass tube into a slender thread, breaking this into fragments two to five lines long, and sealing one end of each of these by holding it a moment in the flame.—Pharm. Era, May 1888, 181.

Distillation—Prevention of Bumping.—Mr. A. Reissmann uses a spiral coil of platinum wire, in which are enclosed some slender fragments of pumice, to prevent bumping The sp. gr. of the combination must be such as to cause it to sink in the fluid. Two or more of the spirals may be required where the apparatus is a large one. The most unmanageable fluids are made to boil quietly in this manner.—Pharm. Era, 1888, 26; from Pharm. Centralh., 1887, 501.

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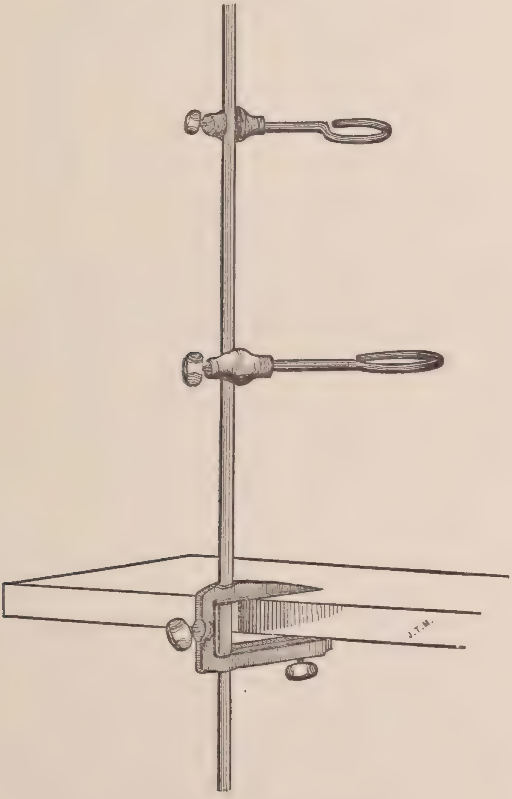
* The idea has been suggested for pharmaceutic purposes a number of years ago (see Proceedings 1878, 95–96) by a Mexican pharmacist, Professor Alphonse Herrera, who applied the process of partial freezing, in an ordinary ice-cream freezer, to the concentration of plant juices for extracts.—Rep.

In a subsequent paper the author recommends also for the same purpose asbestos of long fibre—a ball of the fibres of the size of a hazelnut being placed in the retort or flask. It answers perfectly.—Ibid., from Ibid. 536.

Clamp Retort Stand.—Prof. L. E. Sayre describes the retort stand shown by Fig. 6, which has proved very useful in the Department of Pharmacy of the Kansas State University. It consists of a clamp which may be fastened to a shelf or other means of support in the most convenient place for the operator, by a thumb-screw, having a cap to prevent marring the furniture. Through the clamp an upright iron rod is allowed to slide, being held in position at will by means of a thumb set-

FIG. 6.

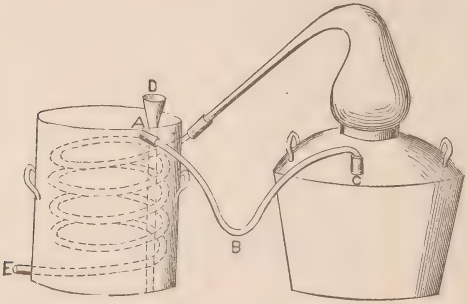


Clamp Retort Stand.

screw. To this rod the retort-rings and other appliances are attached in the usual manner. There is no originality claimed for this appliance.—Pharm. Rec., April 15, 1888, 114.

Automatic Still—Utility for Distilling Water.—Mr. T. Maben describes an automatic still into which ordinary copper stills may be readily converted by the simple arrangement shown in the illustration (Fig. 7), and which he has found very useful in his practice. The only objection that can be urged against its use—the distillation going on continuously—is that the condensed water contains all the free ammonia that may have existed in the water originally, but it is only in cases where the water is very impure that this disadvantage will become really serious. The still is of tinned copper, two-gallon capacity, and the condenser is the usual worm surrounded with cold water. The overflow of warm water from the condenser is not run into the waste-pipe as in the ordinary course, but carried by means of a bent tube *A*, *B*, *C*, to the supply pipe of the still. The bend at *B* acts as a trap, which prevents the escape of steam. It is easy to regulate the flow of the heated water to the still, so that the contents of the latter may be always kept boiling rapidly; or it may be run in at intervals, as practice may determine. It is necessary that the level at *A* should be about 2 inches higher than the level of the bend at *C*. When commencing distillation the still should only contain water to the extent of about one-fourth its capacity, as the water in the condenser becomes heated much more rapidly than the same volume is vaporized. A two-gallon still may then be made to yield about six gallons of water per day.—Pharm. Jour. and Trans., April 21, 1888, 881.

FIG. 7.



Automatic Still.

Liebig's Condenser—Simple Construction.—Mr. E. Hart recommends a new method of constructing a Liebig's condenser, which has the advantages of simplicity and considerable flexibility. It consists of two plain glass tubes, an outer and an inner, connected by a piece of stout rubber tubing. Through a hole in the rubber tubing at either end, a small piece of glass tubing, with a shoulder fused on the inner end, is pushed, which serves for the passage of water.—Amer. Drugg., Dec. 1887, 221; from Jour. Anal. Chem.

GENERAL LABORATORY WORK.

Pharmacopœial Assays—Desirability of Extension to a Larger Number of Drugs.—In reply to a query on this subject, Mr. W. G. Gregory speaks favorably of the extension of the list of drugs for pharmacopœial assay. He proposes that the following be added to the list: Aconite, belladonna, ipecac, nux vomica, colchicum, hydrastis, hyoscyamus, jaborandi, jalap, and podophyllum. More might be mentioned, but he considers it inexpedient to have, at the present, too long a list, lest the projected advancement be thereby neutralized. As to the method of assay, this must be subject of further experiment. In the case of drugs containing alkaloids, in the absence of the more certain method of absolute isolation, the use of Mayer's reagent will doubtless serve good purpose. Proc. N. Y. St. Pharm. Assoc., 1888, 176–178.

Qualitative Tests—Comparative Delicacy.—Mr. J. S. C. Wells communicates a paper in which he gives a table showing the comparative delicacy of the more important reagents employed to determine qualitatively the following metals: Silver, mercury, lead, bismuth, copper, cadmium. The reagents embraced by the table are: NH_4Cl, HCl, KBr, KI, H_2S, $K_2Cr_2O_7$, NH_4OH, $SnCl_2$, Cu, H_2S in KOH solution, H_2SO_4, K_2SnO_2, K_4FeCy_6 and H_2S+HCl. This table will be conveniently referred to in West. Drugg., Jan. 1888, 10.

Test Papers—Practical Directions for Preparation.—Mr. E. Dieterich makes some practical suggestions respecting the preparation of test papers. Either blotting or fine writing paper is used for this purpose, the latter being especially useful for testing liquids by applying drops with a glass rod, because the liquid does not penetrate, and the white paper acts as a back-ground to the colored layers. As a preliminary treatment the paper should be placed during twenty-four hours in diluted water of ammonia (1:10), then pressed to remove excess of liquid, and dried by hanging the wet sheets upon strings or wooden rods. This treatment removes acids, which all papers contain to a greater or less extent. If blotting paper is to be impregnated, this is done by passing the sheets through the color solution, removing the excess of liquid by drawing the paper over a glass rod, and then hanging up to dry. If writing paper is to be treated, this is best done by coating it with the test solution on one side only, by means of a brush (or, the editor of "Am. Drugg." suggests, by floating the paper on the surface of the liquid contained in a flat-bottomed vessel), and then drying it. The following formulas will produce solutions suitable for making highly sensitive test papers:

Blue Litmus.—Macerate 50 parts of litmus, previously crushed to a coarse powder, with enough distilled water to make the liquid, after filtration, amount to 1000 parts. To this add phosphoric acid in drops, until the blue color begins to assume a faintly reddish tint. Then impregnate the paper as above directed.

Red Litmus.—This is made preliminarily precisely as the above, but phosphoric acid is added until the solution is decidedly red; it is then allowed to stand 24 hours, decanted from a brownish, flocculent precipitate that will have formed, and filtered.

Azolitmin.—This is a solution of the pure coloring matter of litmus, now made by several manufacturers, and is prepared as follows: Dissolve 1 part of azolitmin and ½ part of crystals of carbonate of sodium in 1000 parts of distilled water, and neutralize with phosphoric acid.

Turmeric.—Macerate 15 parts of turmeric with 100 parts of alcohol during a fortnight. Filter the tincture and add it to 400 parts of alcohol and 500 parts of distilled water.

Congo.—Dissolve 1 part of congo-red in a mixture of 7500 parts of alcohol and 2500 parts of water. Paper impregnated with this substance is turned *blue* by acids and *red* by alkalies, just the reverse of litmus. It serves a good purpose in some cases, where the result obtained with litmus remains doubtful, owing to the specific color of the liquid tested. The relative sensitiveness of test papers prepared from the above solutions is given by the author as follows:

			Limit.	*Practice.*
Blue litmus	towards	sulphuric acid	1 : 40,000	1 : 30,000
"	"	hydrochloric acid	1 : 60,000	1 : 45,000
Red litmus	"	potassa	1 : 20,000	1 : 15,000
"	"	ammonia	1 : 60,000	1 : 45,000
Azolitmin	"	sulphuric acid	1 : 40,000	
"	"	hydrochloric acid	1 : 60,000	
Turmeric	"	potassa	1 : 15,000	1 : 10,000
"	"	ammonia	1 : 40,000	1 : 30,000
Congo	"	sulphuric acid	1 : 3,000	
"	"	hydrochloric acid	1 : 2,500	

It is to be understood that by stating that a paper has the limit of sensitiveness at 1 : 30,000 sulphuric acid, this means that the paper will detect the acidity of a watery solution containing 1 part of sulphuric acid is 30,000 of the liquid. While in all other cases the sensitiveness of the test papers is greater towards hydrochloric than towards sulphuric acid, which is explained by the higher atomic numbers of the latter, in the case of congo paper the sensitiveness is less to hydrochloric than to sulphuric acid. Congo paper, also, is far less sensitive as a reagent than any of the others.—Amer. Drugg., March 1888, 48–49; from Phar. Centralh.

Turmeric Test Paper—A Delicate Reagent for Hydrochloric Acid.—Mr. S. J. Hinsdale gives the following method for preparing a test paper that is more delicate than litmus, and will reveal the presence of one part of hydrochloric acid in 150,000 parts of water. Take *unsized* white paper of a neutral reaction, preferably the best white filtering paper; cut it in pieces of about six by seven inches, and impregnate it with tincture of turmeric made from one part of turmeric and eight parts of alcohol. Hang the sheets up on threads, and when they are dry, pass them, one by one, through a bath composed of one part freshly prepared lime water and one and a-half parts of distilled water. This latter operation should be accomplished in fifteen to twenty seconds. Then immediately pass each sheet, rather quickly, through a bath of water, and hang it up to dry. The paper, which has a deep orange color, should be kept in a dry place, and not exposed to the air. In fact, it is best to keep the paper simply impregnated with the tincture of turmeric in stock, and prepare it for use as wanted by passing it through lime water, etc., and drying. When dipped into a liquid containing a minute quantity of acid, the orange color changes to pure yellow, the change being more slowly brought about in very dilute than in more concentrated solutions.—Amer. Drugg., June 1888, 102.

Muter's Carbolimeter—See *Carbolic Acid* under "Organic Chemistry."

Microscope—Uses to the Druggist.—Louisa Reed Stowell has contributed a paper on the uses of the microscope to the druggist, as well as to lawyers and physicians, which will be read with interest, in the "Pharm. Era" (Nov. 1887, 399–400); from Proc. Mich. State Pharm. Association, 1887.

Decolorizing Agents—Effect upon Ozokerite.—Mr. Roman Zaloziecki has made extensive experiments with a view to ascertain the materials and conditions most suitable to economically decolorize ozokerite. He finds that the following quantities of media are required to bleach 100 parts of this substance: Blood charcoal, 120–150 parts; do., extracted with HCl, 50–60 parts; bone-black, 250–300 parts; kaolin, 300–350 parts; silicate of aluminium, 60–80 parts; silicate of magnesium, 60–80 parts. The two last named substances were artificially prepared, and deserve attention. It remains to be ascertained whether these agents possess an equal decolorizing power towards aqueous and alcoholic solutions.—Amer. Drugg., Dec. 1887, 222; from Dingl. Polyt. Jour., vol. 265.

Cleansing Bottles—Use of Porcelain Shot.—Under the name of "porcelain shot," white globules of porcelain are made in Munich. They are made to take the place of ordinary lead shot used for cleaning wine and medicine bottles, as porcelain is entirely free from the objection of producing lead contamination, which is often the result when ordinary shot is used. Their hardness and rough surface producing when shaken greater friction, adapt the porcelain shot well for quickly cleaning dirty and greasy bottles, and as they are not acted upon by acids or alkalies, almost any liquid can be used.—Rundschau, Prag, 1887, 942.

Filing Glass—Method.—Mr. Bornträger recommends to first lay the file in a strong soda lye and while yet wet to dip it into coarse sand. A file treated in this way can be used for filing glassware without the least danger of cracking it.—Rundschau, Prag, 1888, 91.

To Write on Glass—Ready Method.—To write on glass it is necessary to impart to the surface a certain degree of roughness. Such may be imparted by a matt varnish prepared as follows: 90 grams of sandarac and 20 grams of mastic are dissolved in 2 ounces of ether, and from ½ to 1½ ounces of benzol, according to the fineness of the matt required, is then added. The varnish is applied to the cold plate, and after it has set the glass may be heated to insure a firm and even grain. After writing—best with India ink and sugar—the glass may be rendered transparent again by applying a solution of sugar and gum arabic, and the writing may be made permanent by varnishing with a lac or mastic varnish.—Pharm. Era, Jan. 1888, 26.

To Write on Tin.—A correspondent of the "New Idea" gives the following directions for writing on tin boxes: Rub the tin surface with an ordinary lead-pencil rubber, and then write directly on the box with good ink.—Pharm. Era, May 1888, 181.

B. Preparations.

GENERAL SUBJECTS.

Revision of the U. S. Pharm.—A Committee of the Wisconsin State Pharm. Association has reported at the last annual meeting numerous suggestions respecting the next revision of the U. S. Pharmacopœia. The report will be perused with interest, and an abstract of the same may be consulted in Pharm. Era, Feb. 1888, 50–51.

Unofficinal Formulary of the British Pharmaceutical Conference.—At the meeting in 1887, the Brit. Pharm. Conference adopted a limited number of formulas for unofficinal preparations, the demand for which is sufficiently frequent to warrant some authoritative method for their preparation. In comparison with the number of unofficinal preparations embraced by the "National Formulary" of our own Association, the number in the "British Formulary" is quite insignificant, being only *thirty-seven* all told. Among these are: three for elixirs, three for fluid extracts, eight for syrups, and fifteen for tinctures. Our British brethren are to be congratulated that the practice of prescribing semi-proprietary articles in Great Britain is so limited as to justify the adoption of so small a number of formulas, some of which, indeed, are officinal in our own Pharmacopœia. These formulas have been abstracted for this report, and will be found under the respective headings of their classes indicated by the letters *B. P. C.*

Pharmacopœia of the Philadelphia Hospital.—Since the publication of the formulæ in use in the Philadelphia Hospital in the February and March numbers of the "American Journal of Pharmacy," 1876, many new preparations have been introduced, and others more or less modified, and a new edition has recently been issued, which is now reproduced in Amer. Jour. Pharm., June 1888, 313–317. For convenience of reference the following titles may find place here.

AROMATIC DILUENTS.

Aqua anethi, aqua capsici, aqua carui, aqua pimenti.

EMULSIONS.

Gaultheria oil, cod liver oil, cod liver oil and hypophosphites, cod liver oil and lactophosphates, cod liver oil and phosphate of sodium, cod liver oil and wild cherry, cod liver oil and quassia, castor oil.

GLYCERITES.

Tannic acid, gallic acid, iron, iodine, castor oil, biborate of sodium.

LINIMENTS.

Aconite, ammonia, arnica compound, chloroform compound, oil of amber, green soap, turpentine, turpentine compound.

SOLUTIONS.

Carbolic acid (of different strengths), boric acid, tannic acid, phosphoric acid compound, antiseptic, cinchona, Dobell's, corrosive sublimate, permanganate of potassium, quinidine, zinc and alum, sulphate of zinc.

LOTIONS.

Sulphurous acid, calamine, cocculus Indicus, yellow, black, Pagliari's styptic, alkaline tar, subacetate of lead and opium, red, chlorate of sodium, chlorate of sodium and opium, hyposulphite of sodium, styptic.

MIXTURES.

Alterans compound, carbonate of ammonium, anticolic, antifebril, aromatic, arsenical compound, astringent, bromides, camphor, chloroform compound, chalk compound, cubeb, diuretic, emmenagogue, expectorant, iron aperient, iron and acetate of ammonium, iron and potassium citrate, iron and potassium tartrate, iron and quinine citrate, iron pyrophosphate, iron and quinine phosphate.

Warm Medicines—Advantages.—Dr. L. Lewin calls attention to the advantage for most purposes of giving liquid medicines warm. The medicine being at a temperature of 40° C. (= 104° F.) is absorbed much quicker and the results are more energetic than when given cold, and need therefore be given in smaller doses. For subcutaneous injection, warming is likewise recommended.—Pharm. Ztschr. f. Russl. 1887, 327.

Chinese Drug Stores in America.—Mr. Stewart Cullen contributes a paper on Chinese drug stores in American cities, in which he enumerates the character of the drugs kept, the method of preparing and dispensing them for use, and the peculiarities connected with them. The paper may be consulted in Amer. Jour. Pharm., Dec. 1887, 593–598.

Prescription Writing.—An editorial in "Amer. Drugg." (June 1888) discusses the practicability of devising some surer mode of writing prescriptions and expressing quantities of ingredients to be used. It is advised to abandon all abbreviations, the use of the genitive, and the employment of Latin directions to the dispenser. Uncertainty as to the proper termination of the Latin name of a remedy is the reason why the custom of abbreviating the name has grown to be the rule, and the writing of the whole name the exception. Attempts have been made to compel the use of English titles in writing prescriptions; but this is impracticable, and it is suggested that physicians be prevailed upon (or compulsory laws passed) to express the title of each ingredient in the nominative, writing it out in full, just as it stands in the pharmacopœia or dispensatory. The objectors to this plan could only be the lazy, shiftless, or ignorant prescribers, whose objection should certainly be of less weight than the welfare of those who are likely to be affected by an incorrectly written prescription. There is quite as little sense in attempting to give directions to the dispenser in Latin as there is in the pretense that is made of using the genitive. These should be written out plainly in English, and so much as is desired to be put on the label should be so indicated. The time has passed for hocus-pocus and mummery, for wearing professional garments and wigs, carrying gold-headed canes, and concealing the nature of medical directions in mongrel Latin. Every physician cannot be expected to be a genius, but no man is fit to be a physician who cannot write an order for the compounding of a prescription in a manner which will admit of its being read by others without the possibility of a mistake.

Poison Laws—Doubtful Value of their Enactment.—In another editorial (Amer. Drugg., May 1888,) some pertinent remarks are made respecting the futility of existing poison laws to prevent cases of poisoning. Two recent cases in point are mentioned, the one in which the poison was taken with deliberate intent, the other as the result of pure stupidity. In neither case does the existence of a law regulating the sale of poisons by druggists seem to have any utility, and so far as can be judged from the experience of a few years, the public would be just as well if such laws did not exist. It is even argued that there would be greater security if each person appreciated that he must exercise precaution in taking the contents of any bottle, and if the responsibility of misadventure rests upon himself and not upon the druggist; for there is ground for belief that there would really be less risk of accidental poisoning if there were fewer legislative restrictions and fewer distinctive poison bottles. It is entirely beyond the ability of druggists to prevent the misuse of poisons, and that stringent laws are not a preventive either of accidental or intentional poisoning, is clearly shown by the fact that there is evidently quite as much truth in this direction abroad as there is in this country, notwithstanding that in European countries more stringent poison laws exist than in our own.

ABSTRACTA.

Abstract of Jalap—Determination of Resin.—Mr. W. L. Turner has employed the following method for determining the amount of resin in abstract of jalap: 20 grains of the abstract is rubbed in a mortar with warm water gradually added, and the water carefully poured off until all trace of sugar was discharged and the water remained clear and colorless. The resulting resin was dried upon a water bath and weighed. Abstract made from jalap averaging 12 per cent. of resin, yielded 4.8 grains, equivalent to 24 per cent. of resin, the quantity it should contain. Assays made in the same manner of abstracts from jalap root of different strengths, gave the same good results, and the process may therefore be considered reliable. As a result of his investigations the author is thoroughly persuaded, in view of the variability in the strength of jalap root of commerce, that a more reliable abstract may be obtained by thoroughly incorporating one part of jalap resin with three parts of milk sugar. This would correspond to a strength of 25 per cent.—the abstract made from jalap root of officinal quality (12 per cent. resin) containing 24 per cent.—Proc. Penn. Pharm. Assoc., 1888, 33–34.

ACIDA.

Mixtura Sulfurica Acida—Proposition to Make it from Ethyl sulphuric Acid and Alcohol.—According to Mr. O. Linde this preparation of the Pharm. Germ., which is made by the admixture of 1 part of conc. sulphuric acid and 3 parts of alcohol, is very variable, and liable to change further in its composition. He proposes the preparation of a definite mixture, which is not liable to change, by mixing ethyl sulphuric acid and alcohol in such proportions that the resultant preparation shall contain from 25 to 30 per cent. of the pure acid; the titre to be established with solution of potassa.—Arch. d. Pharm., June 1888, 509; from Phar. Centralh., 1888, 151.

AQUÆ.

Distilled Water—Automatic Preparation.—See Automatic Still under "Apparatus," etc.

Distilled and Aromatic Waters—Practical Observations.—Mr. Adolf Vomacka makes some practical remarks on distilled and various aromatic waters. Respecting *distilled water*, he observes that not every kind of water is suitable for the preparation of a pure article. The most effective method to obtain absolutely pure water is deemed by the author to be that prescribed by the Pharmacopœia of the Netherlands. The water, previous to distillation, is treated with permanganate of potassium until the violet color of the liquid remains permanent. Next, a solution of alum is added so as to render the water faintly acid, and the water then allowed to stand so as to become clear by settling. The clear liquid is transferred to the still, and the middle portion of what passes over is to be preserved as *pure* distilled water.

Aromatic Waters.—In the author's judgment, the most advantageous method of preparing aromatic waters from essential oils, is the following: Cause the essential oil to be soaked up by filtering paper, introduce the latter, torn into shreds, into distilled water warmed to between 35° and 45° C. (95°–113° F.), shake thoroughly and frequently while the liquid cools to the ordinary temperature, and filter.—Amer. Drugg., May 1888, 85.

Medicated (Aromatic) Waters—Simple Process of Preparation.—Mr. Richard. L. Igel overcomes the objections to the different processes of preparing aromatic waters:

For example, to make 2 pints of aqua menthæ piperitæ take a No. 33 filter; lay it upon any smooth clean surface, a light of window glass or a pill tile, drop upon its surface thirty minims (well distributed) oil of peppermint, fold the paper and tear it into small fragments, introduce them into any suitable bottle, add one fluidounce of distilled water and shake the contents to a pulpy consistence; now add water, one or two fluidounces at a time, two or three times consecutively, shaking well after each addition, then add all or most of the two pints of water and throw the whole upon a filter, using the reserved portion of the water to wash the pulp, and make the product measure two pints.—Amer. Jour. Pharm., Aug. 1887, 392–393.

Medicated Waters—Precautions to Secure Permanent Products.—A writer in "Rundschau" (Prag) remarks that a satisfactory process for preparing medicated waters so that they will keep, has not as yet been published. The different substances used for dividing the essential oils, as powdered French chalk, carbonate of magnesium, infusorial earth, etc., contain impurities which necessitate their preliminary cleaning, and make it tedious to employ them. This labor can be obviated by using a well sterilized Swedish filtering paper for the division of the oils. But this is not sufficient. One of the chief causes why the water spoils and gets ropy notwithstanding the utmost care in its preparation, is that the distilled water used is not carefully made. The water must be chemically pure, but since even the purest obtainable water always contains bacteria and their germs, causing increase of the micro-organisms by standing, it is easy to understand that most waters get ropy. According to Pasteur, a temperature of 110° C. (230° F.) is necessary to render water and utensils perfectly germ-free. Tyndall recommends repeated boiling of the substances, and lets them boil for 5 or 10 minutes for 3 or 4 days. These repeated boilings are more sure to kill the micro-organisms than a long continued boiling. Not only the water, but also the bottles, filter paper and funnels, must be sterilized. Stoppering with cork ought to be avoided, but it is recommended to use India-rubber stoppers, or caps, cleansed with boiled water and live steam. When everything is ready, the filtering paper is cut into strips, impregnated with the requisite quantity of essential oil, and distributed in the water. Allow it to stand in a warm place, shaking occasionally, and after most of the essential oil has been taken up by the water, filter it through a sterilized filter, fill into the sterilized bottles, and close them air-tight with an India-rubber stopper. The size of the bottles must be regulated according to the amount used. In this way we get a medicated water which answers all requirements, and which will keep unaltered for a very long time.—Drugg. Circ., March 1888, 54.

Aromatic Waters—Preservation.—To prevent the mouldy smell and taste and loss of aroma, which follow when aromatic waters, particularly rose and orange-flower water, are kept in the cellar for some time, E. Kraft recommends the cork of the container to be provided with a small opening, 1 mm. wide, in the centre, to admit the atmospheric air. Medicated waters kept in this way will never spoil.—Phar. Zeitung, p. 311.

Orange Flower Water—Microscopic Growths.—Mr. H. Barnowin calls attention to the presence of a microbe in some orange flower water distilled from the flowers of the yellow orange, which differs somewhat from the hygrocrocis hydrolatorum generally found in distilled waters. The microbe is found in yellowish, apparently granular masses, which under a power of 500 diameters prove to be composed of very small yellow globular cells devoid of motion, but which have a tendency to reunite on separation. These colored organisms are somewhat rare in distilled waters and further investigation of them would prove interesting.—Drugg. Circ., Dec. 1887, 275; from Rep. de Pharm.

Bitter Almond Water—New Method of Preparation.—Mr. O. Linde having in a former investigation shown that the officinal (Germ. Pharm.) bitter almond water is of variable composition, now proposes the preparation of a water of definite composition as follows: Acid hydrocyanic (1 per cent.), 10.0; benzaldehyd cyanhydrin, 4.5; benzaldehyd, 3.0; water, 827.0; alcohol, 155.5. Total, 1000.0 parts. The bitter almond water so prepared is somewhat more turbid than that prepared by distillation and fulfils all the requirements of the pharmacopœia to the letter. With the exception of benzaldehyd cyanhydrin, for the preparation of which he gives a process (which see under "Organic Chemistry"), all the components of the formula are readily obtainable.—Arch. d. Pharm., Sept. 1887, 779; from Pharm. Centralh., 1887, 390.

Aqua Laurocerari—Variation according to the Period of Distillation.—Mr. Perinelle points out that the strength of cherry laurel water will vary considerably according to the time of the year at which it is prepared and to the variety of the cherry laurel employed. The two periods of the year when the leaves are most readily obtained in quantity are May and November, when the shrub is clipped. Cherry laurel water prepared in May yielded only 39 milligrams of hydrocyanic acid per 100 grams of water, but that prepared in November afforded 134 milligrams per 100 grams. The author expresses the opinion that the variety *Caucasica* is the one that should be officinal. The leaves are thicker, darker, less rounded than those of the variety *Colchica*, and the plant is more robust and less susceptible to frost. The leaves also yield a larger quantity of volatile oil, viz., 75 grams per 50 kilograms.—Pharm. Jour. and Trans., Aug. 27, 1887, 170; from Répertoire de Pharm., Aug. 1887, 331.

Aqua Laurocerari, etc.—Hydrocyanate of Chloral a Proposed Substitute.—See *Hydrocyanate of Chloral*, under "Organic Chemistry."

Distilled Water of Witch-hazel—Particulars of Manufacture.—Mr. John Keifer obtained from a large distiller in Connecticut particulars as to the manufacture of the distillate, of which the following is an outline: The twigs of hamamelis are collected with the buds in the fall and early winter, are cut into pieces from 6 to 12 inches in length, and then distilled from copper stills in the presence of water, and usually by means of steam. The first portion of the distillate is milky, subsequently it is clear. About a ton of twigs is used to produce one barrel of distillate, to which is added from 5 to 7 gallons of alcohol as a preservative, a pound of the finished product representing from 6 to 8 pounds of twigs. This so-called distilled extract is clear, colorless, entirely volatile, and has a somewhat pungent aromatic odor.—Amer. Jour. Pharm., July 1887, 334.

Naphthol Water—Preparation and Uses.—Dr. Ruault prepares "naphthol water," by dissolving 125 gm. β naphthol in 88 gm. of alcohol, and mixing a teaspoonful of this solution with a liter of lukewarm water. Naphthol water is used for purulent discharges from the nostrils. The unpleasant sensation produced by the use of this liquid disappears in a short time. For intolerant patients a weaker mixture may be used, or a preliminary spray of cocaine may be employed. Amer. Jour. Pharm., June, 1888, 276; from "Arch. Laryngol."

Aqua Magnesiæ—Formula.—The following formula for "aqua magnesiæ" is given by Mr. E. Dieterich: Dissolve 50 parts of sulphate of magnesium in 100 parts of water, and filter. Also dissolve 60 parts of crystallized carbonate of sodium in 100 parts of water, and filter. Then pour both solutions, at the same time, in a thin stream, into 4000 parts of water which is being constantly stirred, and contained in a capacious vessel. The resulting precipitate is washed with distilled water (which should be quite cold), by decantation, until nitrate of barium ceases to render it turbid, about eight repetitions of the washing process being required. Then mix the residue with enough water to make the whole weigh 1000 parts, pass a stream of carbonic acid gas through the liquid (contained in a suitable vessel), until the precipitated salt is dissolved, and transfer the solution into bottles of 6 to 7 ounces capacity, which should be stored in a cool place, lying on their side. Amer. Drugg., April, 1888, 75.

COLLODIUM.

Collodion.—Preparation from "Photoxylin," a variety of nitro-cellulose made from wood-pulp. See "Photoxylin" under "Organic Chemistry."

Collodion—Rapid Preparation.—Mr. Chevreau proposes that the ether be poured first upon the pyroxylin while agitating the mass, and the alcohol added as soon as absorption is completed.—Amer. Jour. Pharm., Aug. 1887, 401; from Jour. de Pharm., June, 1887.

Iodol Collodion—Formula.—Mr. A. Bilteryst gives the following formula for a 10 per cent. iodol collodion:

Iodol	10 gm.
Alcohol	16 "
Ether	64 "
Gun cotton	4 "
Castor oil	6 "

Dissolve the iodol in the alcohol and ether previously mixed, add the gun cotton in small portions, and after complete solution add the castor oil. The percentage of iodol can of course be increased to any desired amount.—Pharm. Ztg., 1887, 488; from Jour. de Pharm. d'Anvers.

Antarthritic Collodion—Application in Gout.—Dr. Monin finds the collodion prepared according to the following formula to be very useful in gout: Flexible collodion and ether, of each fifteen parts, salicylic acid four parts, and morphine hydrochlorate one part. It should be applied to the toe every hour; the pain will soon cease and the swelling subside. —Amer. Jour. Pharm., Sept, 1887, 441; from L'Union Méd., 1887.

Corn Remedy—Formula—The following formula is given in "Rundschau" (Prag): Salycylic acid, 10 p.; lactic acid, 10 p.; collodion, 80 p. Mix. The addition of lactic acid is said to increase the efficacy of the preparation very materially.—Amer. Drugg., April 1888, 75.

EMPLASTRA.

Mold for Plasters—Construction, etc.—Mr. Gerhard recommends the construction of a mold for obtaining plaster masses in tabular pieces of regular size and thickness. It consists of a frame of beech wood of the required size, *e. g.* internal length 30 cm. by 20 cm. width. The pieces constituting the frame are 2 cm. thick and 3 to 4 cm. broad. The frame is placed upon a perfectly level plaster-board or table, a sheet of paper being placed beneath the frame. The four corners of the frame are then weighted down, and the melted plaster mass, partly cooled, is poured into the mold so formed. Perfectly regular tabular pieces of plaster are then secured, which are easily removed from the frame and from the paper when cold. If the plaster mass is poured in too hot, the cooled plaster becomes fissured and easily breaks into fragments.—Arch. d. Pharm., March 1888, 220; from Pharm. Centralh., 1888, 82.

Lead Plaster—Preservation of its Adhesiveness.—Dr. Hager recommends the addition of 3 to 4 per cent. of vaseline to lead plaster, with a view to preserving and even increasing its adhesive properties. Old, brittle plaster may be restored by the addition of 8 to 10 per cent. Vaseline has the advantage over the vegetable oils usually added for the same purpose, in that it does not impart, on keeping, the strongly rancid odor due to the latter.—Arch. d. Pharm., May 1888, 418; from Pharm. Centralh., 1888, 133.

Emplast. Hydrargyri sine Terebinthina—Formula.—Mr. E. Dieterich recommends the following formula for preparing plaster of mercury without turpentine, the presence of the latter being sometimes objectionable: 187 grains of mercury are extinguished with 40 grams of mercurial ointment; 673 grams of lead plaster (freed as much as possible from glycerin and water) and 100 grams of yellow wax are melted together, stirred until the mass thickens, and the mercury mixture is then incorporated. When sufficiently cool the mass is rolled out on wet parchment paper. Arch. d. Phar., Sept. 1887, 781; from Pharm. Centralh., 1887, 353.

Court Plaster—A New Substitute.—The following formula is recommended as a substitute for court plaster: Mastic, ʒiij; balsam of Peru, ʒj; narcotine, ʒvj; chloroform, ʒvj. The dry substances must be powdered separately and then added to the chloroform. It forms a calming and adhesive preparation suitable for neuralgia, or tender, inflamed, or abraded surfaces. Bits of linen or silk dipped into it answer the same purpose as the so-called court plaster. Amer. Drugg., July 1887, 125; from Lond. Med. Rec.

Caoutchouc Plasters—Manufacture.—Dr. F. Hoffmann gives an interesting description of the manufacture of rubber plaster mass, such as is used for the preparation of the different porous and similar plasters of commerce, which see in Pharm. Rundsch., Nov. 1887, 254–257.

ELIXIRS.

Elixirs—Question of Admission into the U. S. Pharm.—Mr. Geo. M. Beringer, in view of the near approach of the next decennial revision of the Pharmacopœia, discusses the propriety of the incorporation of formulas for elixirs. He shows by a review of his prescription files from 1884 to 1888, that in every 1000 prescriptions compounded during that period, an average of over 50 either contained an elixir or was wholly composed of such: simple elixir being represented by an average of 11, elixir of iron, quinine, and strychnine by 8, and elixir of calisaya bark by an average of 13 in every 1000. These figures correspond very closely with those observed in Philadelphia, by Mr. Turner, and by Dr. Eccles for San Francisco, while the observation of the latter as regards Brooklyn shows that nearly double that proportion of elixirs is prescribed in Brooklyn. Mr. Beringer argues that, while he does not wish to detract one iota from the value of the labors of the National Unofficinal Formulary Committee, there should be no middle party, or go-between, in preparations which rank in frequency of use and importance with fluid-extracts, tinctures and syrups. There should be but one authority and that authority should be the national standard. That the Pharmacopœia should permit uncertainty to longer exist, in preparations contained in from 5 to 10 per cent. of the prescriptions compounded, seems hardly possible. It would indicate that the committee on revision were attempting to blindfold themselves to the onward march of pharmacy. The elixirs, as a class, have come to stay, and the time is ripe for the next Pharmacopœia to stamp its insignia of authority upon those preparations which are daily prescribed.—Amer. Jour. Pharm., June 1888, 283–286.

Elixir Cascara Sagrada—B. P. C. Formula.—Take of: Tincture of fresh orange peel, 2 fluid ozs.; rectified spirit, 1 fluid oz.; cinnamon water, 3 fluid ozs.; syrup, 6 fluid ozs.; liquid extract of cascara sagrada (see under "Fluid Extracts"), 8 fluid ozs. Mix.

Elixir Guaranæ—B. P. C. Formula.—Take of guarana, in No. 60 powder, 4 ozs.; light magnesia, ½ oz.; oil of cinnamon, 6 minims; syrup, 2 fluid ozs.; proof spirit, a sufficient quantity. Mix intimately the powders, and moisten them with three fluid ounces of proof spirit. After twenty-four hours' maceration, mix with eight ounces of coarse sand, and pack in a percolator; pass through proof spirit until sixteen ounces are obtained, then transfer the mass to a press-bag and apply pressure. To the percolate add the syrup and oil of cinnamon, and make up to a pint by the addition of the expressed liquid, previously reduced by evaporation if necessary.

Elixir Simplex—B. P. C. Formula.—Take of: Oil of bitter orange, 30 minims; rectified spirit, 6 fluid ounces. Dissolve, and add distilled water, 7 fluid ounces; syrup, 7 fluid ounces. Mix. Filter through paper moistened with proof spirit, and well sprinkled with kaolin, returning the first portion of filtrate until it passes through bright.—Yearbook of Pharm., 1887, 585–586.

Elixir of Theine Hydrobromate—Formula.—Mr. Joseph W. England, after discussing the characters of the various salts—so-called—of theine (or caffeine, as it is generally called), proposes the following formula for an elixir of hydrobromate of theine, a combination from which more useful results can be expected than from the other combinations of the alkaloid with acid: Take of theine, ʒiss; dilute hydrobromic acid, f℥j; water, f℥j; elixir of orange, q. s. ad Oj.

Dissolve the theine in the water and hydrobromic acid, with the aid of heat, filter and add the orange elixir. Dose: 1 to 3 teaspoonfuls. The product is a clear, transparent, water-white liquid, pleasantly bitter in taste, almost neutral in reaction, miscible with an equal volume of alcohol without precipitation. Each teaspoonful contains one grain of anhydrous theine hydrobromate ($C_8H_{10}N_4O_2HBr$).—Amer. Jour. Pharm., June 1888, 280–282.

Elixir of Phosphate of Iron, Quinine and Strychnine—Formula.—According to the experiments of Mr. Frank P. Dalzell, an elixir of phosphate of iron, quinine and strychnine that has a permanent light green color and is not bitter to the taste may be obtained as follows: Dissolve 2 grains of strychnine sulphate and 128 grains of hydrochlorate of quinine in 4 fluidounces of alcohol; then add 6 fluidounces of glycerin. Dissolve 256 grains of phosphate of iron (U. S. P. 1880) and 32 grains of citrate of potassium in 6 fluidounces of hot water. Rub up 24 grains of saccharin with 40 minims of water of ammonia, add the iron solution, then the alcoholic solution, and mix intimately.—Proceedings N. Y. State Pharm. Assoc., 1888, 191.

Elixir e Succo Liquiritiæ—Improved Manipulation.—In order to secure a clear preparation, Mr. J. Seidel, while not changing the proportion of the ingredients, manipulates as follows: 30 parts of succus liquiritæ are dissolved in 90 parts of aqua foeniculi, 5 parts of liquor ammonii caust. are added, the mixture is well shaken, securely corked, and set aside for several days. A solution of 1 part of oleum anisi in 24 parts of alcohol is then added, and the mixture allowed to stand in a moderately warm place to settle. A light-brown, dense precipitate forms, from which the elixir may be decanted clear after a few days. Archiv d. Pharm. May 1, 1888, 418; from Pharm. Ztg., 1888, 181.

Aromatized Elixir of Licorice—Formula.—Mr. P. E. Hommell communicates the following formula for preparing an "elixir" which he finds an excellent vehicle for disguising the bitter taste of quinine:

Fluid extract of licorice root	4	fl. oz.
Oil of nutmeg	2	minims.
Oil of anise	5	"
Oil of coriander	6	"
Oil of fennel	4	"
Deod. alcohol	8	fl. oz.

Dist. water	7 fl. oz.
Carb. magnesia	120 grs.
Syr. simplex	13 fl. oz.

—Proc. N. J. Pharm. Assoc., 1888, 85.

Elixir of Saccharin—Formula.—Mr. Petit proposes the following formula for an elixir ("chartreuse") suitable to diabetic affections: Elixir of chartreuse (compound spirit of melissa), 100 gm.; alcohol of 50 per cent., 900 gm.; saccharin, 3 gm.; bicarbonate of sodium, 1.50 gm. The addition of soda renders the saccharin soluble.—Jour. de Phar. et de Chim., March 1, 1888.

Terpin Elixirs—Formulas.—Mr. Vigier recommends the following preparations of terpin: Terpin, 50 cgm.; alcohol 95 per cent., 2 gm.; glycerin of 30° B., 4 gm. This keeps indefinitely, its amount of alcohol is small, and its doses divide nicely into teaspoonfuls. An elixir containing 50 gm. of terpin to the tablespoonful may be made as follows: Terpin, 50 cgm.; glycerin, 7 gm.; alcohol 95 per cent., 7 gm.; honey, 7 gm.; vanillin, 2 mgm. Honey is preferable to simple syrup, because it does not form crystals, and the vanillin gives the preparation an agreeable flavor. Arch. de Pharm., Oct. 1887, 5.

Elixir of Black Currant—Formulas.—Mr. J. L. A. Creuse communicates some formulas for elixir of black currant, which is a well-known preparation in France, and a popular vehicle for many medicines which become more acceptable to the stomach when administered in its combination. The following are the formulas recommended:

(1)	Black currants	4 pounds.
	Alcohol, 95 per cent.	4 pints.
	Sugar	4 pounds.
	Water, sufficient for	16 pints.

Crush the currants with a wooden pestle, introduce them into a wide-mouthed bottle, add about two and a half pints of alcohol, and set the whole aside for a week, with an occasional agitation. Then press out the liquid, reserve the first maceration, and add to the dregs the remainder of the alcohol. After another week's maceration, express the liquor with strong pressure, mix the two macerates together, add the sugar, complete the measure with water, and after 48 hours' contact, filter the finished elixir.

(2)	Black currants	3½ pounds.
	Raspberries	½ pound.
	Alcohol	4 pints.
	Sugar	5 pounds.
	Water, sufficient for	16 pints.

Operate as above.

(3)	Black currants	3½ pounds.
	Raspberries	½ pound.
	French brandy	8 pints.
	Sugar	5 pounds.
	Water, sufficient for	16 pints.

Make two successive macerations of the fruits previously crushed, in different portions of the brandy, and complete as above.

As examples of combinations of the black currant elixir, Mr. Creuse gives the following:

Hydrochloric Acid Elixir.—Elixir of black currant, 14 fl. ozs.; simple syrup, 2 fl. ozs., pure hydrochloric acid, 160 drops. Dose: Half an ounce, taken in water.

Pepsin and Acid Elixir.—Elixir of black currant, 14 fl. ozs.; simple syrup, 2 fl. ozs.; pepsin, 192 grains; pure hydrochloric acid, 160 drops. —Drugg. Circ., June 1888, 123.

EXTRACTA.

Powdered Extracts — Difficulties in their Preparation.— Dr. E. R. Squibb, whose aim has for many years been the production of solid extracts in powdered form, has recently again gone over the ground and made experiments in different directions to secure this desirable condition. While in the case of a few solid extracts he succeeded to obtain powdery form, and though he has not given up the subject entirely, the conclusions reached are that he cannot at present convert many extracts into a powder of one grain to two and a half of the drug that will withstand summer temperature without caking, and that hence it is therapeutically much better to dispense them of a pilular consistence, and give the approximate strength on the label. The author has found it quite practicable to make this approximate strength fairly uniform; that is, to make it the same for different parcels of the same drug by being careful of the uniformity of the quality of the drug used. He cannot understand on the other hand how so many manufacturers get all of their extracts into the powdered condition.—Ephemeris, Oct. 1887, 982–984.

Extracts—Determination of Copper.—Mr. D. P. Shuler has made experiments with a view to determine whether copper is present in extracts to an injurious extent. The extract, to the amount of 3 or 4 grams, was heated in a porcelain crucible until nearly incinerated, cooled, 10 to 15 drops of concentrated sulphuric acid were added, the whole heated until sulphuric vapors were given off, the mixture cooled, about 1 c.c. of water added and heated to boiling, when about 10 c.c. more of water was added, the solution filtered and the filter washed to 20 c.c. of filtrate. The filtrate was neutralized with concentrated solution of potassa, then acidulated by the addition of 2 or 3 drops sulphuric acid, and tested for copper by the following method of Cresti (Gazz. chim. Ital., 1877, 7,220):

"Into the slightly acidulated solution a small strip of platinum foil, resting on a piece of granulated zinc, is placed, and allowed to remain for several hours. The platinum is removed, exposed for a few seconds to the fumes of bromine and of hydrobromic acid obtained by heating solid bromide of potassium with concentrated hydrobromic acid, when, if copper be present, a violet to purple color is observed, due to solution of cupric bromide in hydrobromic acid."

The author in this manner examined a number of samples of extracts and fluid extracts with the results below given, which indicate that the extracts, either solid or fluid, do not contain copper to an injurious extent —the test being sensitive to one part of metallic copper in 100,000 parts of the extract:

		Manufacturing house of	
Extract of	taraxacum	A	fair test for copper.
"	gentian	A	" "
"	damiana	A	" "
"	cannabis indica	A	decided deposit of copper.
"	buchu	A	copper present.
"	digitalis	A	" "
"	hyoscyamus	A	" "
"	belladonna	B	" "
"	cannabis indica	B	decided coat of copper.
"	gentian	C	copper present.
"	belladonna	D	" absent.
"	podophyllum	D	" present.
"	aconite	E	" "
"	hops	F	decided coat of copper.
"	nux vomica (foreign)	G	copper absent.
"	ignatia amara	H	" "
"	taraxacum	I	" "
"	conc. "digitalin"	J	decided coat of copper.
"	ergotin (foreign)	K	copper present.
Fluid ext.	cannabis	L	" absent.
"	berberis aquif	M	trace of copper.

—Pharm. Era, Oct. 1887, 361; from Proc. Mich. Pharm. Assoc., 1887.

Extracts—Determination of Dextrin.—Mr. A. Pannetier states that the addition of dextrin to extracts is a more frequent occurrence than is ordinarily supposed. He gives the following method of testing such extracts: Two gm. of the substance is dissolved with trituration in 50 gm. of cold distilled water, and 5 gm. of liquid sub-acetate of lead are added, to precipitate the tannin, gums, alkaloids and coloring matters. The precipitate is then washed upon a filter with cold distilled water. The filtered liquor re-united to the water used in the washing, contains the excess of the sub-acetate of lead, certain alkaline salts which the extract may possess normally, and the dextrin, if any be present. The lead is then disposed of with sulphuric acid or a current of sulphuretted hydrogen. After filtering and washing the lead precipitate the liquor is evaporated to a fifth of its volume. Usually it is not necessary to carry the evaporation so far; but an equal bulk of alcohol of 96 per cent. must be added. If the extract is not adulterated the liquid remains clear; if dextrin be present, a precipitate goes down, formed largely of dextrin united to a small quantity of such alkaloids as are insoluble in alcohol. The alkaloids will not sensibly affect a calculation as to the amount of dextrin present, but the dextrin may be turned into glucose and calculated as such if considered desirable.—Jour. de Pharm. et de Chim., Jan. 15, 1888; Amer. Jour. Pharm., March 1888, 139.

Alcoholic Extracts—Tests of Quality.—Mr. S. Feldhaus describes a method for determining the quality of alcoholic extracts, which is based: 1. Upon the solubility of the extract in the original solvent; 2. Upon the relative solubility of the extract in water and in diluted alcohol; 3. Upon the amount of substance that has become insoluble in the original menstruum. The author gives examples of the application of the method to a number of extracts.—Arch. d. Pharm., April 1888, 299–302.

Narcotic Extracts—Modification of Dieterich's Method of Assay.—Mr. E. Dieterich has modified the method recommended by him for the assay of narcotic extracts (see Proceedings, 1887, 37–39) in some particulars. The extract (2 grams, except in the case of nux vomica, in which 1 gram is used) is added to water (3 grams), and coarsely powdered lime (10 grams) is mixed in, the whole forming a crumbly mass, which is transferred to the extraction apparatus, and extracted with ether—which must be free from acid—in the manner heretofore recommended by him, the remaining steps in the method being also the same.—Arch. d. Pharm., May 1888, 419; from Helfenberger Annalen, 1887.

Extract of Nux Vomica—Method of Assay.—Mr. H. Beckurts gives the following directions for the assay of extract of nux vomica: Two grams of the finely powdered extract are dissolved in a mixture of 5 c.c. of water, 5 c.c. of water of ammonia and 10 c.c. of alcohol. The solution is shaken with three successive portions of 20, 10 and 10 c.c. of chloroform. The united chloroformic solutions are evaporated, the residue is dissolved in 15 c.c. of decinormal hydrochloric acid, the solution is filtered and the filter well washed with pure water. The united filtrate and washings are then titrated with centinormal soda, cochineal being used as indicator. Subtract the number of c.c. consumed from 150 and multiply by 0.00364, to obtain the total alkaloid in 2 grams of extract (assuming strychnine and brucine to be present in equal proportion). The percentage of alkaloid is found by multiplying the result by fifty. The author also gives the following directions for the assay of

Extracts of Belladonna, Henbane and Aconite.—Dissolve 2.5 grams of the extract in a mixture of 3 c. c. of alcohol and 6 c. c. of water; add

1 c. c. of water of ammonia, and shake out with three successive quantities of chloroform precisely as in the above process for extract of nux vomica. The residue of evaporation is dissolved in 5 c. c. of decinormal hydrochloric acid, filtered, washed, the filtrate and washings are titrated as in the above case, with centinormal alkali, and the number of c. c. of alkali consumed subtracted from 50. The product is multiplied by 0.00289 in the case of extracts of belladonna and henbane, and by 0.00533 in the case of extract of aconite. The product being the quantity of alkaloid contained in 2.5 grams of extract, the percentage is obtained by multiplying by forty.—Pharm. Era, Dec. 1887, 447; from Pharm. Centralh., 1887, 508.

Extract of Opium—Estimation of Narcotine.—Mr. A. Kremel dissolves 1 gram of extract in 20 c.c. of water, filters and mixes with 10 grams of acetate of sodium, after which the mixture is shaken several times with ether. The ethereal liquids are mixed and allowed to evaporate, when the residue will be narcotine. A few drops of alcohol added before evaporation will cause it to crystallize.—Drugg. Circ., June 1888, 128; from Schweiz. Wochenschr. f. Pharm.

Extract of Licorice—Commercial Quality.—Mr. E. Goodman has examined a number of the best foreign and domestic brands of extract of licorice, and arrives at the following conclusions:

1. The domestic brands contain nearly twice as much (viz., 10 per cent.) of glycyrrhizin as the foreign.

2. The foreign brands are more soluble than the domestic, and have a richer flavor; they give dark brown transparent solutions, while those of domestic brands are lighter colored and opalescent.

3. From a commercial standpoint the foreign brands may be said to excel; from a pharmaceutical standpoint the preference is given to the domestic.—Pharm. Era, July 1887, 248–249; from Proc. Ohio State Pharm. Assoc., 1887.

Acetic Extract of Ipecacuanha—Commercial Quality.—Messrs. J. W. Thomson and William Duncan have examined several samples of the acetic extract as found in the market. From published statements it appears that ipecacuanha yields on an average 18 to 22 per cent. of acetic extract, while the root yields 1.6 to 1.7 per cent. of emetine. The acetic extract should, therefore, contain from 8 to 8.5 per cent. of emetine, taking the average yield of extract to be 20 per cent. Nine samples had been examined; seven were in powder and two lumpy. Three had been standardized, two with a silicate, apparently kaolin, and one with what appeared to be finely powdered exhausted root. No sample was entirely soluble in water, proof or rectified spirit; all were slightly acid. The yield of ash varied from 10 to 39 per cent., 10 per cent. being the natural yield. When volumetrically estimated by Mayer's reagent they gave the following results: A=4.72, B=5.19, C=6.1, D=7.0, E=6.2, F=7.1, G=8.0, H=5.18, I=5.7 per cent. of emetine. Inasmuch as *Wine of Ipecacuanha, B. P.*, is now made officinally from the acetic extract, the authors, in consideration of the variability of the strength of the commercial extract, recommend that this extract be standardized to contain at least 6 per cent. of emetine. Otherwise they recommend a trial by pharmacists of the simple method for the preparation of the acetic extract (the circumstantial method of the B. P. being at present the stumbling-block) given by them in 1886, according to which the root is to be macerated in acetic acid for twenty-four hours, then transferred to a water-bath and the free acetic acid driven off, the acetified root then to be macerated in sherry. They claim that this process gives little trouble. The minimum of heating is required, and the product is in every way equal to that prepared by the Pharmacopœial method.—Pharm. Jour. and Trans., March 24, 1888, 834–835.

Extract. Secalis Cornuti—Pharm. Germ.—Yield, etc.—Mr. H. Rolffs obtained by careful manipulation from 4 kg. of ergot 400 gm. of extract. Comparing this yield and the cost of the ergot with the price at which the extract is offered, he concludes that a properly prepared extract cannot be supplied.—Chem. Repert., (Chem. Ztg.) Jan. 29, 1888, 32; from Apoth. Ztg., 1887, 2, 455.

Extract of Strophanthus—Advantages over the Tincture.—See *Strophanthus*, under "Materia Medica."

Extract. Trifolii, Pharm. Germ.—Modification of Process.—Mr. C. Danot observes that while the German Pharmacopœia requires that extract trifolii should form a clear solution with water, the preparation made according to that standard forms such a solution only under the most favorable conditions, and never after the extract has been kept for some time. To secure a preparation that will respond to this, as well as other requirements of the Pharmacopœia, he recommends the following process: 100 parts of the drug are macerated with 400 parts of distilled water during 24 hours, then expressed strongly, and the residue treated in the same way with 300 parts of distilled water. The liquids are heated to boiling in a porcelain vessel, immediately after expression, and then concentrated by evaporation to 35 parts. The extract is set aside in a cool place for 8 or 10 days, then dissolved in 100 parts of cold distilled water, the solution allowed to settle for one or two days, and then filtered. The filtrate is then evaporated to the consistence of extract, the yield being about 30 per cent.—Chem. Repert. (Chem. Ztg.), Jan. 22, 1888, 25; from Pharm. Ztg., 1887, 32, 719.

Malt Extract—Presence of a Peptonizing Ferment.—Mr. J. F. Carl Jungk records some experiments which show that a well prepared diastatic extract of malt is capable of converting vegetable albumin into peptone. Whether the peptonizing action is due to the diastase or some other ferment has not been determined. The author proposes the preparation of a *Substitute for Mother's Milk*, which is based on this observation, the following being his directions:

Mix together, at the ordinary temperature, a heaping teaspoonful of the best sifted wheat flour, a large wineglassful of fresh cow's milk, the same quantity of good water, and one and a half teaspoonfuls of diastatic extract of malt. The mixture is heated for 10 minutes at 65° C. (149° F.), an operation which is readily conducted over the open fire and controlled by occasional removal of the vessel from the fire. The temperature is then raised for 10 minutes to 74° C. (165° F.), then heated slowly to boiling, allowed to boil up several times, and then rapidly cooled by placing the vessel in cold water. It is essential that the mixture be continually stirred during the process of heating.

Mr. Jungk regards this preparation to be a perfect substitute for mother's milk, and states that experience has proven it to be such. The above quantity is sufficient for 24 hours for a child of three months.—Pharm. Rundschau, Aug. 1887, 179–182.

Malted Acorn Extract—Preparation.—In order to utilize the starch in the preparation of acorn-extract, which is used for the preparation of "acorn-cacao," Mr. E. Dieterich adds a certain proportion of malt (sufficient for the 30 per cent. of starch usually contained in the acorns) and the mixture is subjected to the well known process of mashing, the maltose formed obviating the necessity of adding milk sugar. The powdery extract eventually obtained contains, besides about 70 per cent. of carbohydrates in form of maltose and dextrin, over 5 per cent. of albumen and 10 per cent. of tannin, and has a pronounced but pleasant taste. It is best given dissolved in hot milk or mixed with cocoa deprived of fat.—Arch. d. Pharm., May 1888, 419; from Helfenberger Annalen, 1887.

Extract of Coffee—Concentration by Refrigeration.—Mr. Paul Noirot, of Paris, is the patentee of a new method of preparing extract of coffee, which is said to yield a very satisfactory product. Roasted and ground coffee of the best quality is treated with boiling water in the usual manner, and the infusion caused to freeze by appropriate refrigerating apparatus. The ice crystals are rapidly crushed, and separated, in a centrifugal machine, from the dense accompanying extract, which does not itself freeze. This extract, which is thus freed from about 90 per cent. of its aqueous constituent, is then completely deprived of water in a vacuum apparatus, and the residue made into tablets or cakes.—Amer. Drugg., April 1888, 76.

Extract of Tamarinds—Preparation.—Mr. E. Dieterich recommends the following method of making extract of tamarinds: Mix together

1000 parts tamarinds and 5000 parts water, and allow to stand twenty-four hours with frequent stirring, then strain through a closely woven linen or cotton bag, press twice between boards, and filter the solution. Evaporate to a thin extract. This constituting about 50 per cent. of the tamarinds employed, has a brown color, is transparent, and soluble in water almost to a clear liquid.—Amer. Drugg., Dec. 1887, 229; from Neues Pharm. Manual.

EXTRACTA FLUIDA.

Fluid Extracts—Proposition to Substitute them by a Class of Preparations Representing only 50 per cent. of Drug.—Mr. C. Benkma records a number of experiments in which he kept an accurate account of the cost of preparing fluid extracts. His record leads him to conclude that although it may be desirable from a professional point of view, yet it not being pecuniarily profitable to the druggist to prepare his fluid extracts, it would be desirable to abolish them, and introduce in place of both the fluid extracts and tinctures, a new class of preparations, representing only 50 per cent. of the drug from which they are made. Such preparations, under a new name, might be made as follows: Take of the drug, in suitable powder, one part by weight, macerate and percolate with the proper menstruum until one part of percolate is obtained; remove the partly exhausted drug from the percolator, and macerate and percolate again until one part more of percolate is obtained, mix the two percolates, and in order to secure uniformity let the product be assayed and a certain standard of extractive be established, as is now done with the tincture of nux vomica.—West. Drugg., March, 1888, 84–86.

Fluid Extracts—Suggestions as to Preparation without Heat, etc.—Prof. E. B. Stuart records the results of an extensive series of experiments, made under as nearly as possible like conditions by students in the Chicago College of Pharmacy, to determine the rate of extraction by the officinal process for fluid extracts, the sp. gr. and the percentage of extractive in the several portions of percolate, the cost, etc. Selecting senna as the drug to be operated upon, he found that the first 14.16 fluid extract contained an amount of extractive which fully represented the amount of drug which that volume of finished fluid extract would contain, viz., 6195 grains. To continue the extraction of the drug to practical exhaustion requires the use of a large amount of menstruum, entailing cost, and during the subsequent evaporation this remaining fraction suffers more or less injury. In view of the difficulty of standardizing the galenical preparations of organic drugs on the basis of their active principles, the author suggests that possibly such standardizing may be practically accomplished on the basis of the amount of extractive; and, if this view is found to be correct, it might be expedient to stop percolation at that point at which the percolate obtained contains an amount of extractive corresponding to that which its volume would contain if the fluid extract was finished in the officinal manner. This, as has been shown, would be for senna leaves 14.16 fluidounces. Experiments would determine the proper point of intercepting percolation in the case of others.—Pharm. Era, April 1888, 128; from Proceedings Ill. Pharm. Association, 1888.

Fluid Extracts—Process of Repercolation.—Dr. E. R. Squibb, in "Ephemeris," Oct. 1887 (993–1040), gives a reprint of his paper on repercolation as applied to the preparation of fluid extracts, as originally published in these Proceedings (1878, 708 et seq.), together with footnotes and addenda prompted by his experience since its publication.

Fluid Extracts—Simple Method for Estimating Glycerin, which see under "Organic Chemistry."

Liquid Extracts—Formulas of the Brit. Pharm. Conference.—The following liquid extracts are embraced in the "Unofficinal Formulary:

Extractum Grindeliæ Liquidum, B. P. C.—The drug (20 ozs.) is used in No. 20 powder; the menstruum is rectified spirit.

Extractum Hamamelidis Liquidum, B. P. C.—The drug (20 ozs.) is used in No. 40 powder; the menstruum is a mixture of one volume of rectified spirit and two volumes of distilled water.

Extractum Hydrastis Liquidum, B. P. C.—The drug (20 ozs.) is used in No. 60 powder; the menstruum is a mixture of equal parts (volume? Rep) of rectified spirit and distilled water.

The process is the same for all: Moisten the powder with eight fluid ounces of the menstruum, pack it tightly in a percolator, and pour on sufficient menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop, close the lower orifice and macerate for forty-eight hours; then allow the percolation to proceed, gradually adding menstruum until the drug is exhausted. Reserve the first seventeen ounces of the percolate, and evaporate the remainder (recovering the alcohol if desirable) to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the liquid extract measure one pint.—Year-Book of Pharmacy, 1887, 586–588.

Extractum Chinæ Liquidum de Vrij—Preparation and Characters.—Mr. H. Nanning prepares a liquid extract by a formula worked out by Dr. De Vrij, which, in distinction from the formulas hitherto proposed, is stated to answer all requirements. The finely powdered bark of *cinchona succirubra Jav.* (containing seven per cent. of alkaloid) is made into a thick magma with water, ten per cent. of its weight of glycerin is added, and then a quantity of normal hydrochloric acid corresponding to the amount of alkaloid in the bark. This converts the alkaloids into soluble cinchotannates, in which form they exist in the finished extract. After macerating 24 hours, the magma is transferred to a glass percolator and displaced with water until the percolate no longer gives a precipitate with soda solution. The clear liquid is then concentrated in glass retorts, in which a vacuum is produced by the aid of an air-pump, upon a water bath, until the extract has exactly the weight of the bark employed. The resulting extract constitutes a clear, brownish-red fluid, having an acidulous-bitter taste, containing five per cent. of alkaloids (about 10 to 20 per cent. of the total alkaloid being unextractable), and all of the active constituents of the bark in a soluble and unchanged condition; while the useless and undesirable constituents—such as cinchocerin, etc.—are not extracted. By concentrating in vacuo, the cinchotannic acid remains unchanged, whereas in the ordinary extracts this is converted into insoluble cinchona-red by the action of the heat and air. The liquid extract so prepared is particularly useful for preparing cinchona wine, forming clear solutions both with wine and with water.—Arch. d. Pharm., June 1888, 507–508; from Pharm. Centralh., 1888.

Fluid Extract of Podophyllum—Examination of Precipitate.—Mr. Herman Heinritz gives the results of an examination of the precipitate usually found in fluid extract of podophyllum, the main object being to examine the precipitate for resin of podophyllum. Upon the advice of Prof. J. U. Lloyd, the precipitate was mixed with 5 times its volume of cold water, the mixture well stirred, set aside one hour, then filtered and the residue on the paper dried in a cool place and weighed. It was then treated with cold alcohol so as to dissolve all that was possible, the alcoholic solution evaporated to a thin syrup, and this passed into 10 times its volume of cold water. The precipitate, collected and dried in a cool place, was resin of podophyllum, having a light-brown (not yellow) color, almost entirely soluble in diluted ammonia, soluble in alcohol, and to a large extent (75–95 per cent.) in ether. The precipitates obtained from different fluid extracts contained between 1.53 and 10 per cent of their (the precipitates') weight of the resin; the fluid extracts from which they had deposited between 1.9 and 3.85. per cent. of the resin. The root of podophyllum is known to contain from 1.08 to 5 per cent. of resin. One sample of precipitate contained beside resin of podophyllum 0.75 per cent of podophyllotoxin; 0.66 per cent. podophyllic acid; 0.306 per cent. of gum; and some gallic acid, albumen, fat, oil, and a little picropodophyllin, but no tannin—Amer. Drugg., Dec., 1888, 222; from the Author's Thesis.

Fluid Extract of Cascara Sagrada—Proper Menstruum.—Mr. Wm. Bichy states that all the published formulas tried by him failed to ensure a fluid extract of cascara sagrada that did not precipitate. He finds, however, that when it is prepared according to the following formula it furnishes a permanently clear preparation. A sample is described by the author that had remained clear for six months.

Drug in No. 60 powder	1 lb.
Alcohol	1½ pts.
Water.	½ pt.

Moisten and pack in percolator; macerate for forty-eight hours, collect the first 13 fluid ounces, evaporate the remainder to 3 ounces, and mix with the reserved portion.—Amer. Jour. Pharm., Feb. 1888, 92.

Tasteless Fluid Extract of Cascara Sagrada—Preparation.—Mr. Fr. Grazer communicates the following method for making a tasteless fluid extract of cascara sagrada (see *Cascara Sagrada* under "Materia Medica"): The coarsely powdered bark (16 ounces) is mixed with a magma of 1 ounce of calcined magnesia and 10 ounces of water; the mixture is packed into a percolator, allowed to stand 12 hours, and 10 fluidounces of strong alcohol poured on. When the alcohol has penetrated the mass, diluted alcohol is added until percolation begins, when the orifice of the percolator is closed and maceration continued for 24 hours. The fluid extract is then finished with diluted alcohol in the usual manner. If desired 5 to 10 per cent. of glycerin may be introduced in the preparation, which is free from bitter taste, and preserves the full activity of the drug.—Pharm. Rundschau, Jan. 1888, 9.

Fluid Extract of Buckthorn (Frangula)—*Advantages over Other Officinal Aperient Compounds.*—Dr. E. R. Squibb, in a paper entitled "Aperients," discusses the various *medicinal* agents that find application as such, and more particularly the aperient compounds that are officinal in the U. S. Pharm., viz.: Confection of senna, compound fluid extract of senna, mixture of rhubarb and soda, pills of aloes, pills of aloes and asafœtida, of aloes and mastic, of aloes and myrrh, the compound pill of rhubarb, the compound effervescing powder, and the fluid extract of frangula (or, more appropriately, buckthorn). While all of these are prominent and excellent aperients when doses are carefully adjusted to individual cases as they arise, he expresses the opinion that none of the others excel the last named, the fluid extract of buckthorn bark. He considers it the simplest and least disagreeable of all the aperients, and perhaps the one to which the most fastidious persons least object. It makes a clear solution with any proportion of the officinal diluted alcohol or with brandy, or may be more usefully taken in the less sightly dilution with water. The main difficulty with this aperient is the adjustment of dose to different individuals, in some cases 10 minims producing the desired aperient effect, while in others a fluid drachm may be too little. A

Fluid Extract of Cascara made exactly parallel to that of buckthorn, given in the same quantity to the same person, had the same general effect as the buckthorn, but operated less pleasantly. Moreover, the cascara was the far more disagreeable dose—much more bitter and less aromatic—the bitterness being exceedingly persistent.—Ephemeris, June, 1888, 1054–1063.

Fluid Extract of Yerba Santa—Menstruum.—Mr. F. B. Quackenbush records some experiments made with a view to establishing the strength of the menstruum best calculated to extract and retain in solution the constituents of "yerba santa" (eriodictyon glutinosum) in fluid extract. He finds that a menstruum of 3 parts of alcohol and 1 part of water answers the purpose admirably, furnishing, by the directions given, and for which reference may be had to the author's paper, a fluid extract of peculiar odor, a dark olive-green color, and an astringent and strongly bitter taste. A fluid extract made with a menstruum of 2 parts of alcohol and 1 part of water was not so satisfactory. The odor was about the same, but its color was much lighter, and it was deficient in astringency and bitterness.—Amer. Jour. Pharm., February 1888, 74–76.

Fluid Extract of Belladonna Leaves—Proper Menstruum.—Mr. Wm. M. Edwards regards a stronger alcoholic menstruum—a spirit of 70 or 80 per cent.—more suitable than diluted alcohol for belladonna. The latter gives a dark colored fluid extract, while the former produces a fluid extract of a more or less green color and, while being a better solvent for the alkaloidal constituents of the drug, dissolves less of the extraneous matter.—Pharm. Era, March 1888, 90; from Proc. Wisc. Pharm. Assoc.

Fluid Extract of Cimicifuga—Proper Menstruum.—Mr. Edwin C. Lesher has made fluid extract of cimicifuga with different alcoholic menstrua, viz., alcohol, diluted alcohol, mixture of 2 parts alcohol and 1 part water, and mixture of 3 parts alcohol and 1 part water. He found that the drug was most completely exhausted by a mixture of 3 parts of alcohol and 1 part of water, while the fluid extract was equal if not superior to that made with alcohol alone.—Amer. Jour. Pharm. Jan. 1888, 7–8.

Extractum Rubi Fluidum—Proper Menstruum.—Mr. Charles Born Evans remarks that the fluid extract of blackberry, as made by the formula authorized by the Pharmacopœia, is a preparation which decomposes quite rapidly, and upon standing for a short time becomes very unsightly. He has experimented in order to ascertain whether a menstruum could not be found that would prevent this decomposition, and yet extract the medicinal properties of the drug, and has succeeded in making some preparations which have stood very well for a month or two. Six different preparations were made, using the bark in all cases in No. 60 powder. The menstruum for No. 1, was alcohol 9 parts, water 7 parts, with 20 per cent. of glycerin; for No. 2, of alcohol 2 parts, water 1 part, and 20 per cent. of glycerin; for No. 3, alcohol 3 parts, water 1 part, with 20 per cent. of glycerin; for No. 4, alcohol 4 parts, water 1 part, with 20 per cent. of glycerin; for No. 5, alcohol 3 parts, water 1 part, glycerin 30 per cent.; and for No. 6, alcohol 4 parts, water 1 part, with 30 per cent. of glycerin. The author found it impossible to prevent a slight precipitation when the reserve portion and the evaporated soft extract were brought together, but in some cases this residue was quite inert. The deposits in Nos. 1 and 2, however, were quite heavy, and the menstrua employed in these are evidently quite unsuitable for preservation, though in these, as well as Nos. 3, 4, 5 and 6, the menstruum exhausted the drug completely. Any of the menstrua used in the four last processes seems to yield a practically permanent preparation.—Amer. Jour. Pharm., May 1888, 227–229.

Fluid Extract of Caulophyllum—Experiments as to Menstruum.—Mr. J. H. Bunting records experiments made to determine the relative value of different menstrua for the preparation of fluid extract of caulophyllum. Using diluted alcohol, a mixture of diluted alcohol and glycerin, mixtures of 1 part of water with 2 and 3 parts of alcohol respectively, he found that the first three gave more or less unsatisfactory preparations, whilst the fluid extract made with a mixture of 1 part of water and 3 parts of alcohol furnished a good fluid extract, which remained clear with only a slight deposit after allowing it to stand undisturbed more than 2 months. —Amer. Jour. Pharm., Feb. 1888, 73–74.

Fluid Extract of Quebracho—Value in Burns, Frost-bites, etc.—Dr. Bourdeaux finds fluid extract of quebracho to be a useful application to burns, ulcers and frost-bites; it dries in the course of half an hour, forming a tough and very adhesive brownish crust, which can be removed only with the aid of warm water; and cicatrization advances rapidly.—Amer. Jour. Pharm., Nov. 1887, 586.

Fluid Extract of Lacturium.—Preparation of half strength for preparing the *syrup*, which see under "Syrups."

Fluid Extract of Scutellaria—Modification of Officinal Formula.—Mr. Henry W. Howard, in view of his observation that the officinal extract of scutellaria always forms a deposit (see *Scutellaria*, under "Materia Medica"), and that this deposit contains a portion of active matter, has made experiments which lead him to suggest the following modification of menstruum to be employed for its preparation:

Alcohol	70 parts.
Glycerin	10 parts.
Water	20 parts.

To be followed, after this has been used upon 100 parts of the drug, by a menstruum containing:

Alcohol	70 parts.
Water	30 parts.

A fluid extract prepared by the author with these menstrua had not formed any precipitate after standing several months.—Amer. Drugg., Dec. 1887, 222; from the Author's Thesis.

Fluid Extract of Scutellaria—Prevention of Precipitate.—Mr. Edward Pennock observes that fluid extract of scutellaria as seen in the shops usually has a certain amount of precipitate. He states that the formation of this precipitate may be prevented or considerably lessened by using a menstruum containing 5 per cent. of glycerin; the percentage of alcohol is not stated.—Amer. Jour. Pharm., July 1887, 334.

Fluid Extract of Logwood—Preparation from the Unfermented Wood.—Mr. Louis Siebold recommends the following as an efficient preparation of logwood (which see under "Materia Medica"). The unfermented logwood is ground, extracted repeatedly with boiling water acidulated with a few drops of hydrochloric acid, the united and drained infusions are evaporated at a moderate temperature to the original weight of the wood employed, allowed to settle for a week, and the clear fluid extract is decanted. The preparation is elegant, permanent, and has the s. g. 1.06.—Year-book of Pharm., 1887, 550.

Fluid Extract of Wild Ginger (Asarum)—Proper Menstruum, etc.—Mr. F. P. Streeper records some experiments made to determine the proper menstruum to be used for making fluid extract of wild ginger. These experiments seem to show that the activity of the drug is due exclusively to volatile oil and resin, and that to completely extract these and retain them permanently in solution in the finished fluid extract, a menstruum of 95 per cent. alcohol or nearly this strength is necessary.—Amer. Jour. Pharm., Jan. 1888, 6–7.

Extractum Lappæ Fluidum—Proper Menstruum.—Mr. Edwin C. Lesher records some experiments made to determine the most suitable menstruum for making fluid extract from burdock root. Comparing the color and proportion of the several preparations obtained with menstrua of different strengths, he finds that made with diluted alcohol (U. S. P.), to be by far superior to the others.—Amer. Jour. Pharm., Dec. 1887, 600–601.

GELATINA.

Gelatinum Ferri Oxidi—Formula.—Mr. E. Dieterich communicates the following formula for an "Iron Jelly." Dissolve 3 parts of the best white gelatin in 30 parts of water by the aid of heat. Mix together 12 parts of solution of oxychloride of iron (Phar. Germ.), 20 parts of syrup of orange flowers, 15 parts of brandy, and 20 parts of distilled water, and add this to the warm gelatin solution contained in a capsule. Then immediately add 0.5 parts each of water of ammonia and solution of soda (Pharm. Germ.), previously mixed together, and incorporate thoroughly. On cooling, a reddish-brown, transparent jelly results, which has an alkaline reaction, a pleasant taste, and contains 0.43 per cent. of iron.—Amer. Drugg., March, 1888, 51; from Pharm. Centralhalle.

Polygraph—New Mass.—The following is recommended as a good combination for preparing a mass for the polygraph: Treat 100 parts of isinglass with cold water until it is softened; then boil in 400 parts of water until it is practically dissolved, add 600 parts of glycerin, strain the mixture, and pour it into the forms. One-half the isinglass may be replaced by gelatin.—Amer. Drugg., May, 1888, 88; from Polyt. Jour.

GLYCERITA.

Glycerite of Saccharin—Use as a Substitute for Sugar.—A correspondent of the "Scientific American" (Feb. 18, 1888), gives his experience with saccharin as a sweetening substitute for sugar. After many experiments to get the saccharin into manageable form for convenient use, he found that a solution of 1 drachm of saccharin in 1 pound of glycerin, obtained readily by the aid of heat, to be the best. Such a solution, which very closely resembles in appearance and taste the best white honey, dissolves readily in water, milk, tea, coffee, wines, and liquors, the quantity to be added being in this form readily adjusted by measure. Thus two teaspoonfuls will sweeten eight fluidounces of lemonade from the juice of one lemon perfectly; three teaspoonfuls are sufficient to sweeten four ounces of stewed cranberries, etc., etc.—Amer. Drugg., May 1888, 84.

Glycerite of Resorcin—Formula, etc.—Dr. H. P. Chase has used a glycerite of resorcin in eczema. It is prepared as follows:

Resorcini.	ʒ ij.
Glycerini, q. s. ad	℥ ij.

M. Sig.—Apply with camel's-hair pencil morning and evening.

—Amer. Jour. Pharm., Aug. 1887, 397; from Peor. Med. Jour., June 1887.

INFUSA.

Infusion—Preservation by means of Chloroform.—Mr. Jos. F. Burnett draws attention to the utility of chloroform to prevent the decomposition of pharmaceutical fluids, which under ordinary conditions are very prone to undergo fermentive change. For some substances he uses chloroform water as a solvent with admirable results. He has made preparations in which pulv. rhei was rubbed down with aq. chlorof., likewise pulv. cret. aromat., solutions of quinine, fer. am. cit., pot. acet., pot. citr., and a host of others, some of which are some months old, and as good as the day they were made. A couple of drachms of chloroform will keep for a fortnight as much as three gallons of fresh infusion of gentian. Infusions of calumba or buchu made four times the strength of the B. P. (*i.e.*, conc. 1 to 3) keep perfectly when one drachm of chloroform to the quart is dissolved in them. With infusion of buchu he considers this a distinct advance on using spirit (which the 1 to 7 preparation of the wholesale houses contains), for the chloroform does not throw down any mucilaginous constituent. These are but a few examples of the use of chloroform as a preservative.—Pharm. Journ. and Trans., April 7, 1888, 854.

Infusion of Digitalis—Improved Formula.—Mr. L. G. Blakeslee regards the officinal formula as being incapable of producing an efficient, thorough and elegant infusion, and suggests the following as producing both: Infuse the digitalis in the amount of water directed, for two hours, and filter, then add what would be one-third the bulk of the finished product of cinnamon water and a little alcohol, one-half ounce to a quart being sufficient. The product is clear, permanent, and has a better flavor than that obtained by the officinal method.—Pharm. Era, Aug. 1887, 288.

Infusion of Digitalis—Precautions in its Preparation.—Mr. Broeker draws attention to certain difficulties connected with the preparation of infusion of digitalis. He recommends that only the parenchyma of the leaf, which, he says, contains about 1 per cent. of digitalin, be used for making the infusion, the stalks and nerves being rejected, since they only contain about 0.2 per cent. of the active constituent. Moreover, the presence of these latter is liable to render the infusion gelatinous. With regard to the temperature and time of maceration, the author finds it best to macerate for 2 hours at a temperature of 20° C. At 70° C. a less satisfactory product is obtained.—Amer. Drugg., Jan. 1888, 10; from Nieuw Tijdschr. voor de Pharm. in Nederland.

Infusion of Serpentaria—Avoidance of Starch as a Component.—Mr. F. V. Butterfield draws attention to the fact that infusion of serpentaria when made according to the B. P. is incompatible with tincture of iodine, with which it is somtimes prescribed. It is ordered to be made from the root in No. 20 powder, and thus a certain amount of starch is dissolved out, which, of course, in this case, combines with the free iodine to form iodide of starch, giving a dark-blue inky-looking mixture. This contrasts strongly with a similar mixture made with infusion prepared from the whole root, this remaining quite transparent and containing free iodine, thus carrying out the intention of the prescriber, which it is the duty of every dispenser to do.—Pharm. Jour. and Tran., Dec. 3, 1887, 472.

LINIMENTA.

Ammonia Liniment—Use of Linseed Oil for its Preparation.—Mr. Joseph W. England, in view of the difficulty with which cotton-seed oil is saponified by ammonia water, has experimented to determine a suitable substitute that should at the same time be readily obtainable in an unadulterated state. He finds linseed oil to be such a substitute, forming a creamy liniment most readily, and he suggests the following formula: Take of ammonia water (F. F. F.=sp. gr., .933), 2 fl. oz., linseed oil (U. S. P., '80) 4 fl. oz. Place the oil in a bottle, add the ammonia water in portions at a time, agitating thoroughly after each addition.

The product formed is a cream-like saponaceous liquid, possessing all the stimulating and rubefacient qualities of those made by the older formulæ, and unlike them does not cake on standing. It acquires, however, on standing a month or two, a yellowish tinge, but its properties remain unaffected. Rubbed on the surface of the body it warmly stimulates, and is quickly absorbed by the skin.

St. John Long's Liniment.—The author considers this one of the best turpentine liniments of the day, and when carefully made nothing can be said against it; but there is one feature, in connection with its making, that greatly interferes with its more general employment, and that is the difficulty, at times, of obtaining good eggs, and then, when obtained, of perfectly suspending the very large percentage of oil of turpentine. To obviate this trouble the author has devised a modified formula, without the use of eggs or acetic acid. Owing to the presence of the excess of stimulating ammonia gas, the volatile oil has been slightly reduced in quantity from the original formula. Take of ammonia water (F. F. F.) 1⅓ fl. oz.; oil of linseed (U. S. P. 1880), 2⅔ fl. oz.; oil of turpentine, q. s. ad., 6 fl. oz.; oil of lemon, 30 minims. Mix thoroughly in a bottle the linseed oil, with the ammonia water gradually added. Then add, in small portions at a time, the oil of turpentine, shaking after each addition, and then, lastly, the oil of lemon. The product is a milk-white, thoroughly emulsionized fluid, which separates on standing only after two or more weeks, but can be readily re-united and used after agitation, and compares favorably with that made by the original formula in every way, except that of perfect suspension. It possesses the additional advantage that it can be readily and quickly made, and contains, besides the turpentine, a slight excess of ammonia water, which increases its stimulating qualities.—Amer. Jour. Pharm., Nov. 1887, 549–554.

Linimentum Opii Ammoniatum—B. P. C. Formula.—Take of: Soap liniment, 6 fl. oz.; compound camphor liniment, 6 fl. oz.; tincture of opium, 6 fl. oz.; belladonna liniment, 1 fl. oz.; stronger solution of ammonia, 1 fl. oz. Mix and filter.—Yearbook of Pharm., 1887, 588.

Chloral cum Camphora—B. P. C. Formula.—Chloral with camphor. Rub together 1 ounce each of camphor and hydrate of chloral in a warm mortar until completely liquefied, and filter if necessary.—Yearbook of Pharm., 1887, 585.

Cantharidated Chloral-Camphor—Formula, etc.—Dr. Boni prefers the following combination to the ordinary fly blister: Forty parts camphor are powdered with a few drops of alcohol and mixed with 60 parts of chloral hydrate; 20 parts of powdered cantharides are heated for one hour in a water bath at 140° F. with the chloral camphor, shaking once in a while, and the mixture is strained through cloth. It is best applied by slightly moistening a piece of linen or cotton and keeping it in contact with the skin by strips of adhesive plaster.—Drugg. Circ., Nov. 1887, 250; from Phar. Zeitsch. f. Russl.

Oleum Hyoscyami—Necessity of Employing the Absolutely Dry Leaves in its Preparation.—Referring to Mr. E. Dieterich's suggestions respecting the preparation of oleum hyoscyami, Messrs. Labiche and Serin observe that the cause why the oil as ordinarily prepared contains very little alkaloid, resides in the fact that the fixed oil cannot take up any of the alkaloid until all the moisture in the plant has completely evaporated. The presence of the small quantities of alkaloid in the oil as ordinarily prepared is accounted for by the fact that a portion of the fixed oil is saponified by the combined action of the heat and water-vapor, an oleate of hyoscyamine being formed and dissolved in the oil. These observations apply with the same force to "oleum belladonnæ."—Arch. d. Pharm., Sept. 2, 1887, 836; from Arch. de Pharm., July 1887, 291.

Oleum Cinereum—Formula and Uses.—Oleum cinereum is a mercurial preparation used by Dr. E. Lang in syphilitic complaints. It is prepared by triturating, in a cool place, lard, oil and mercury until the latter becomes uniformly suspended, the finished preparation to contain 20 per cent. of the metal. It is used as a local dressing; also as an injection to enlarged glands, 0.01 to 0.02 c.c. being given once a week or in a fortnight. For use it is melted by the warmth of the hand.—Wien. Med. Woch., 1886; Am. Jour. Pharm., 1887, p. 294.

LIQUORES.

Liquores—Formulas of the Br. Pharm. Conference.—Two liquors are represented in the "Unofficinal Formulary," viz:

Liquor Ferri Hypophosphitis Compositus, B. P. C.—Take of: Hypophosphite of calcium, 320 grains; hypophosphite of sodium, 320 grains; hypophosphite of magnesium, 160 grains; sulphate of iron, 240 grains; carbonate of sodium, 320 grains; hypophosphorous acid, sp. gr. 1.136, 1 fluid ounce; distilled water, a sufficient quantity. Dissolve the hypophosphites of calcium, sodium, and magnesium in 8 ounces of water. Dissolve the sulphate of iron and carbonate of sodium in separate portions of water; mix and wash the precipitated carbonate of iron with sweetened water until the washings cease to give a precipitate with solution of nitrate of barium. Transfer the moist precipitate to the solution of the hypophosphites, and add gradually the hypophosphorous acid. Make up to 1 pint by the addition of distilled water.

Each fluid drachm contains about 2 grains each of hypophosphite of sodium and calcium, 1 grain of hypophosphite of magnesium, and 1½ grain of hypophosphite of iron.

Liquor Picis Carbonis, B. P. C.—"Solution of Coal Tar." Take of: Prepared coal tar (which see under "Hydrocarbons") 4 ounces; tincture of quillaia (which see under "Tinctura"), 1 pint. Digest at a temperature of 120° F. for two days, allow to become cold, and decant or filter.—Yearbook of Pharmacy, 1887, 588–589.

Solution of Chloride of Iron—Quality as Found in Retail Stores.—Mr. E. B. Stuart has examined 50 samples of solution of ferric chloride procured, with a single exception, from retail stores, and gives the results in form of a table. This shows that the solution of ferric chloride is very carelessly prepared by the average apothecary. Only 10 contained within 1 per cent. of the proper quantity of ferric chloride; 5 samples contained too much; 5 samples were within 1 and 2 per cent. under the officinal standard; 5 between 2 and 3 per cent.; 8 between 3 and 4 per cent.; 6 between 4 and 5 per cent.; 6 between 5 and 6 per cent.; 2 between 7 and 8 per cent., and 1 was more than 10 per cent. under. Many of the samples contained much free nitric acid and the hydrochloric acid is generally deficient in quantity. Several contain traces of ferrous chloride, and two samples contain much of it.—West. Drugg., June 1888, 202; from Proc. Ills. Pharm. Assoc., 1887.

Liquor Ferri Oxychlorati—Modification of the Germ. Pharm. Process.—Mr. E. Dieterich proposes the following modification of the officinal (Phar. Germ.) process for preparing solution of oxychloride of iron: 40 per cent. of the prescribed quantity of ammonia are diluted with an equal volume of water, and are added in a thin stream with strong stirring to the ferric chloride solution. The resultant clear solution is diluted with ten times its volume of water, and the remaining 60 per cent. of ammonia, also diluted with ten times the quantity of water, is added as before. The precipitate now produced is washed, pressed, and treated in the usual way with hydrochloric acid, using, however, only 1.8 parts instead of 3 parts prescribed.—Arch. d. Pharm., May 1, 1888, 419; from Helfenberger Annalen, 1887.

Liquor Ferri Albuminati—Formula.—Mr. E. Dieterich proposes the following formula for making a solution of albuminate of iron: Dissolve 3 parts of dried egg albumen (Merck's) in 30 parts of cinnamon water (Phar. Germ.). Dilute 12 parts of solution of oxychloride of iron (Phar. Germ.) with 40 parts of distilled water, and add 12 parts of alcohol. Now mix the two solutions, immediately add 0.75 parts of solution of soda (Phar. Germ.), and set aside. After several hours, filter the liquid through a pellet of cotton, and then pass enough water through the latter to make the product weigh 100 parts. By using only 2½ parts of albumen a more handsome product is obtained; or, by using 5 times as much fresh egg albumen, the solution turns out more clear and transparent. The author also gives a formula for

Liquor Ferri Peptonati.—Dissolve 1 part of dried egg albumen (Merck's) in 19 parts of distilled water, add 0.05 parts of undiluted (*i. e.*, pure, Rep.) pepsin, and digest during 4 hours at 40° C.(=104° F.).

Mix 12 parts of solution of oxychloride of iron (Ph. Germ.) with 3 parts of syrup and 55 parts of distilled water. Mix this liquid with the peptonized albumen, and heat the whole, in a steam bath, to 90°–95° C. Then allow to cool, add 10 parts of brandy, and enough water to make 100 parts. Let the mixture stand during eight days; then pour off the clear solution from the insignificant sediment.—Amer. Drugg., March 1888, 51; from Pharm. Centralhalle.

Solution of Citrate of Iron and Strychnine—Instability of the Officinal Solution.—Dr. E. R. Squibb draws attention to the instability of the officinal solution of citrate of iron and strychnine. When made in strict conformity with the U. S. P. process, a whitish deposit will begin to settle out within two or three hours, and will continue to increase at the bottom of the solution during many days. A slight increase in the proportion of ammonia or of citrate of ammonia will retard the decomposition for a short time, but no proportion tried has rendered the solution permanent for a longer time than three or four days when the proportion of strychnine is kept at 1 per cent. The precipitate in every case contained about 50 per cent. of strychnine.—Ephemeris, June 1888, 1128–1129.

Injectio Curare Hypodermica—B. P. C. Formula.—Take of curare (the South American India (sic) arrow poison), 5 grains; distilled water, a sufficient quantity. Reduce the curare to powder in such a way as to prevent its coming in contact with the naked hand, and add distilled water to form a thin paste. Transfer to a small funnel plugged with absorbent wool, and gradually pour upon it distilled water until one fluiddrachm is obtained. If required in haste, the powdered curare may be mixed with a fluiddrachm of water, filtered through a small filter, and enough water passed through to make one fluiddrachm of filtrate. "Curare" is defined to be an inspissated extract of varying composition, prepared in South America from the bark of different species of Strychnos (principally *Strychnos toxifera*, Schomburgk), and other plants.—Yearbook of Pharmacy, 1887, 588.

Hypodermic Solution of Ergot—Formula.—Mr. Hildebrandt recommends the following formula for making a hypodermic solution of ergot:

Aqueous extract of ergot	3 parts.
Glycerin,	
Distilled water, each	7 parts.

From five to twenty drops may be injected beneath the integument of the thigh or abdomen to check uterine hemorrhage.—Amer. Jour. Pharm., Oct. 1887, 493; from Journal de Médecine; Med. News, Aug. 20.

Manna Lemonade—Formula.—Mr. E. Dieterich gives the following formula for "Manna Lemonade." Dissolve 100 parts of flake manna in

500 parts of distilled water, add 1 part of white bolus, heat to boiling, take off the scum, allow to cool somewhat, add 1 part oil sugar of lemon, and filter. Dissolve 3 parts of citric acid in the filtrate, add 50 parts of syrup, and sufficient distilled water to make 600 parts. The preparation constitutes an agreeably-tasting laxative, especially for children. Another, suitable also for women, is

Tamarind Lemonade, made as follows: Dissolve 30 parts of extract of tamarinds (which see under "Extracta") in 300 parts of distilled water, filter the solution into a strong bottle containing 25 parts of syrup of raspberries, add 2 parts of bicarbonate of sodium, cork quickly and secure the cork.—Amer. Drugg., Dec. 1887, 229; from Neues Pharm. Manual.

Effervescent Solution of Arseniate of Lithium—Preparation and Use.—Dr. Martineau recommends arseniate of lithium in diabetes in the following form: Carbonate of lithium, 3 grains; arseniate of sodium, $\frac{1}{10}$ grain; carbonic acid water, 2 pints. Solution is effected under pressure. The effervescing liquid is taken mixed with claret, the foregoing dose to last for at least three days, being taken at the two principal meals of the day customary in Paris. No change of diet is necessary.—Amer. Jour. Pharm., Nov. 1887, 586.

Colorless Hydrastis—Formula.—Dr. R. G. Eccles discusses the character of the various forms of "colorless hydrastis," so called, and proposes the following formula as calculated to produce a preparation possessing the therapeutic action and composition of the best of them:

Hydrochloride of hydrastine	25 grs.
Chloride of aluminium	23 grs.
Chloride of calcium	20 grs.
Chloride of magnesium	18 grs.
Chloride of potassium	½ gr.
Dilute hydrochloric acid	10 mins.
Distilled water	6 fl. ozs.
Glycerin, enough to make	1 pint.

Dissolve all the salts in the water, after adding the acid, and then mix with the glycerin. If the so-called hydrochloride of aluminium is used instead of the anhydrous chloride, a little more than double the amount is needed. With nitrate of silver a solution of this kind will give a more copious precipitate than the one imitated, owing to the salts being all chlorides, and not, as in it, both chlorides and other unknown organic compounds.—Drugg. Circ., June 1888, 123.

Solutions of Nitroglycerin—Precautions in Case of Spilling, etc. See *Nitroglycerin* under "Organic Chemistry."

Solutions of Anthrarobin—Formulas.—Mr. Behrend recommends the following formulas for solution of anthrarobin, the new substitute for chrysarobin: (1) Anthrarobin, 10 parts; borax, 8 parts; water 80 parts.

(2) Anthrarobin, 10 parts; glycerin, 80 parts.—Amer. Drugg., June 1888, 114; from Therap. Monatshefte.

Solution of Iodol—Formula.—Professor Trousseau uses a solution of iodol for external purposes made as follows: Iodol, 1 gm.; alcohol, 15 gm.; glycerin, 35 gm.—Amer. Jour. Pharm., Dec. 1887, 613; from Union Méd.

Schweizer's Reagent—Preparation, etc.—Mr. H. Baubigny observes that the old method of preparing Schweizer's reagent by dissolving copper in ammonia in presence of air, is defective, since it does not avoid the presence of carbonic anhydride, and hence gives a product with diminished solvent powers. Potassium sulphate and sodium chloride are not decomposed by ammonia nor by the cuprammonium base, and therefore they do not affect the properties of Schweizer's reagent. The best method of preparing Schweizer's reagent is to precipitate a solution of copper sulphate with the calculated quantity of soda and dissolve the hydroxide in ammonia. A similar solution known as

Eau Celeste, is obtained by dissolving copper salts in ammonia, and contains a salt of the type $CuSO_4,4NH_3+H_2O$. Both solutions deposit cupric hydroxide when largely diluted. "Eau celeste" contains salts of the base which exists in the free state in Schweizer's reagent. It follows that solutions of basic cupric salts should behave as mixtures of "eau celeste" and Schweizer's reagent, and this is found to be the case. Such solutions dissolve cellulose more readily the more basic the salt. Conversely, the addition of an ammonium salt to Schweizer's reagent partially converts it into "eau celeste," and if the former has previously been saturated with cellulose, the cellulose is precipitated as the ammonium salt is added. This change is produced by ammonium carbonate and by carbonic anhydride, and it follows, therefore, that when Schweizer's reagent is exposed to the air it will form cuprammonium carbonate, and will eventually be converted into "eau celeste." There can be little doubt that the Schweizer's reagent distributed over vines, as a preventative of mildew, will be rapidly transformed into "eau celeste," which is the actual preservative. The more easily prepared "eau celeste" can, therefore, be used for this purpose instead of the Schweizer's reagent.—Amer. Jour. Pharm., Oct. 1887, 507; Compt. Rend., CIV., 1616–1618.

Solution of Sulpho-Carbonate of Sulphur.—Preparation and use for destroying *Nitroglycerin* (which see under "Organic Chemistry"), in cases of breakage of containers, etc.

Liquor Hydrargyri Chloridi Corrosivi—Convenient Formula for the Dispensing Counter.—Mr. E. H. Naudin observes that in the compounding of prescriptions containing small quantities of bichloride of mercury, such as 1/4 or 1/8 of a grain, which quantities are now largely prescribed by physicians in antiseptic solutions, eye waters, injections, etc., almost every druggist has no doubt been forcibly reminded of the great inconvenience attendant upon the weighing and dividing of a body so specifically heavy as this salt. The author has employed a solution containing 2 grains of corrosive sublimate in the fluid ounce, and finds it a great convenience. Similar solutions being officinal in some other Pharmacopœias, he suggests the adoption of such a solution at the next revision of the United States Pharmacopœia.—Amer. Jour. Phar., April 1888, 174.

Liquor Aluminii Chloridi—Formula.—Mr. E. Dieterich gives the following formula for making solution of chloride of aluminium: Dissolve 25 parts each of sulphate of aluminium and chloride of barium in two separate portions of 50 parts of warm water, mix the two solutions, heat to about 160° F. on a water-bath, allow to cool, filter, and pass enough water through the filter to make 100 parts of product.—Amer. Drugg., April 1888, 75.

MELLITA.

Aromatized Honey of Licorice—Formula.—Mr. P. E. Hommell communicates the following formula for preparing a "honey," which he finds an excellent vehicle for disguising the bitter taste of quinine:

Fl. ext. licorice root	4 fluidounces.
" coriander.	1 drachm.
" fennel	30 minims.
" cardamom	60 "
" anise.	30 "
Deodorized alcohol	4 fluidounces.
Distilled water	5 "
Clarified honey	19 "

Mix and filter.

—Proc. N. J. Phar. Assoc., 1888, 86.

MISTURÆ.

Emulsions—Preparation without a Mortar.—Mr. E. Kraft states that a faultless emulsion may be obtained without the use of a mortar, by simply agitating the oil, gum, and water, in certain proportions, in a vial. First pour 7.5 grams of water into the vial; then 10.0 grams of the oil (almond or any other fixed oil that may be prescribed), and next 5 grams of best gum arabic in very fine powder, and shake energetically. After a while add gradually the remainder of the water.—Amer. Drugg., July 1887, 128; from Pharm. Ztg.

Emulsions with Moss Mucilages—Critical Experiments.—Mr. Albert John Staudt, in view of the adoption by the National Formulary Committee of moss mucilage as an emulsifying agent, has made some experiments to determine the merits of the new emulsifier as compared with gum arabic. He prepared emulsions by agitation, as suggested by Mr. Emlen Painter (see Proceedings 1887, 578–581), and also—using the same ingredients—by trituration in a mortar after the usual manner of preparing emulsions. No difference was observable in the two emulsions, which were uniform and seemed to be practically inseparable, no apparent separation having taken place after standing three months. On the other hand, the oil did not seem to be as minutely or uniformly divided as when made by some of the older agents. The author concludes that, while emulsion of Irish moss is a sure and safe emulsifier, its applicability is probably confined to making stock emulsion in large quantity. For the extemporaneous preparation of emulsions, gum arabic is apparently to be preferred.—Amer. Jour. Pharm., April 1888, 170–173.

Emulsion—Advantageous Preparation with Irish Moss Gelatin, which see under "Gums."

Emulsions—Preparation with Mucilage of Ghatti Gum. See *Indian Gums*, under "Materia Medica."

Emulsions—Preparation with Saccharated Casein.—The following are examples of the use of saccharated casein (which see under "Organic Chemistry") for the preparation of emulsions of oils, resins, balsams, etc.:

Emulsion of Oil.—Take 15 parts of the oil and incorporate it gradually with a mucilage previously made with 15 parts of saccharate of casein and 5 parts of water. When a perfect emulsion is obtained, which is quite easy, add the remaining ingredients.

Emulsion of Copaiba.—Take 25 parts of copaiba, dissolve it in 25 parts of alcohol in a vial of sufficient capacity; and then add a solution of 10 parts of saccharate of casein and 0.2 parts of bicarbonate of sodium in 10 parts of water, and shake forcibly. The emulsion, which forms at once, is then diluted with water, syrup, or both, as the case may be. The addition of bicarbonate of sodium in this case is necessary on account of the presence of free acid in the copaiba, and such addition, in judicious proportion, must be made in the case of all resins or balsams possessing acid properties, so that the coagulation of the casein may be prevented. Emulsions with balsam of tolu, benzoin, ammoniac, camphor, tar, oil of turpentine, etc., are made in the same manner.—Amer. Drugg., Sept. 1887, 161.

Emulsio Olei Morrhuæ—B. P. C. Formula.—Take of cod-liver oil, 40 fluidounces; tragacanth, in powder, 200 grains; simple tincture of benzoin (which see under "Tinctura"), ½ fluidounce; spirit of chloroform, ½ fluidounce; glycerin, 2 fluidounces; oil of cassia, 2 fluidrachms; distilled water, a sufficient quantity. Place the oil in a dry Winchester quart, and pour in the tragacanth, tincture of benzoin, and spirit of chloroform previously well mixed; agitate briskly for a minute; then add all at once one pint of distilled water, and agitate as before. Lastly, add the essential oil, glycerin, and sufficient distilled water to produce four pints.—Yearbook of Pharm., 1887, 586.

Emulsion of Terebene—Formula.—Mr. Joseph W. England observes that as a remedy in the treatment of certain throat affections, terebene has, in the last few years, attained considerable prominence in medical circles, but its employment has been restricted on account of the impossibility of obtaining an emulsion with it, and recourse was then had to the simpler method of giving in capsules or dropping on sugar and dissolving in the mouth, and this is the mode of administration in general use at present. This expedient, however, is a very unsatisfactory one, and the writer here gives a new process for the emulsion, based upon the fact that terebene is readily emulsionized, if previously mixed with an equal volume of cotton-seed oil. The formula used is as follows: Take of terebene, ol. gossyp. sem., āā ♏.clx.; pulv. acaciæ, ʒvj.; pulv. sacchari, ʒij.; aquæ q. s. fiat f℥iv.; mix. Dose: 1 to 2 teaspoonfuls (=10-20 drops). The product is a milk-white, perfectly suspended liquid, having the odor and bitter, turpentine-like taste of terebene, and is miscible with water, without separation.—Amer. Jour. Pharm., Feb. 1888, 68–69.

Mucilage of Acacia—Preservation with Glycerin.—Mr. George P. Ringler suggests the preparation of mucilage of acacia by dissolving 4 ounces of the gum in a mixture of 4 ounces each of glycerin and water. The solution is effected in the usual way by maceration and agitation, and usually requires straining to free it from accidental impurities. To ascertain the preservative influence of glycerin upon the solution of gum, the mucilage prepared according to the Pharmacopœia and several samples containing glycerin were simultaneously exposed to a temperature varying between 65° and 80° F., and it was found that the former would keep for about one week; while a menstruum composed of 28 water and 16 glycerin would render the mucilage serviceable for two weeks; a mixture of 24 water and 10 glycerin for five weeks, and a mixture of 20 water and 15 glycerin for more than seven weeks.—Amer. Jour. Pharm., Jan. 1888, 9.

Paraldehyde Mixture—Formula.—Mr. Schmitt recommends the following very expeditious way of making a mixture of paraldehyde: 20 parts of paraldehyde are vigorously shaken in a bottle with 30 parts of syrup and 60 parts of mucilage, and then at once 90 parts of water are added, shaking again. If the quantity of water does not greatly exceed 90 parts, the paraldehyde will remain suspended.—Drugg. Circ., April 1888, 81; from Rundschau Prag.

Creasote Mixture—Ferrand's Formula.—Ferrand's creasote mixture for bronchitis, is as follows: Creasote, gtt. ij; essence of lemon, gtt. ij; syrup of orange flowers, gtt. xxx; water, gtt. cxx. A teaspoonful may be taken at intervals of 2 to 3 hours.—Amer. Drugg., April 1888, 76.

Bismuth Mixtures—Disadvantage of Mucilage.—In contradiction to the opinion expressed by a recent writer that when bismuth is prescribed in a mixture mucilage must be added to suspend it, Mr. Joseph F. Burnett takes exception for several reasons. In the presence of mucilage the bismuth is liable to settle to the bottom of the vial, and adhere so firmly in the course of a few days that no amount of shaking will again diffuse it. The addition of glycerin, on the other hand, would be a decided improvement.—Pharm. Jour. and Trans., April 7, 1888, 854.

Phosphate of Copper Mixture—Formula.—Dr. Luton, believing phthisis to be amenable to cure or amelioration by the administration of phosphate of copper in the nascent state, and dissolved in alkaline menstruum, gives the following formula for a mixture, the dose of which is one tablespoonful: Neutral acetate of copper, 0.05; crystallized phosphate of sodium, 0.59; mistura acaciae, 1.25. The author also prescribes the remedy in pills, which see under "Pilulae."—Amer. Drugg., June 1888, 114; from L'Union Pharm.

PILULÆ.

Pills—Objection to the Use of Magnesia as Excipient.—A correspondent of the "Schwz. Wochenschr. f. Pharm," cautions against the use of calcined magnesia in making pill masses from oleo-resins, balsams, turpentine, creasote, etc. Pharmaceutically speaking, nothing is handier than magnesia—a good mass is formed and the pills are not inconveniently large; but therapeutically they are a failure; at first quite soft, they soon become as hard as stone, and pass through the intestinal tract quite unchanged. Their hardness is so great that they can be kept for several hours in water of 176° F. before they show signs of disintegration.—Drugg. Circ., May 1888, 107.

Pills—Suitable Excipients for Certain Kinds.—Mr. F. V. Butterfield makes some practical remarks on dispensing, and among them speaks of the difficulties encountered and overcome in making the following pills:

Pills of Cascara Sagrada.—Extract of cascara sagrada, owing to its disagreeable taste, is frequently prescribed in form of pill, which is often very refractory, it being a difficult matter to prevent them "falling." Pills sent out as hard as they could possibly be made have been too frequently returned *en masse*. After trying various excipients, with little success, the softening of the pills and consequent "falling," could only be attributed to absorption of moisture; so, in order to prevent this, a coating of varnish was tried, and proved the supposition to be correct. In dispensing pills containing ext. cascar. sag., varnishing (or coating with gelatin, etc.) is, therefore, considered a *sine qua non*. The commercial extract is usually very soft when fresh, and, if kept from damp and moisture, becomes harder on keeping, and much more difficult to manipulate. The best way is to at once evaporate it down by means of a water-bath, when it becomes very brittle and is readily reduced to powder, making up to original weight with some inert powder, as sugar of milk, and preserving in a stoppered bottle.

Pills of Ox Gall.—Fel bovinum being also of a hygroscopic nature may be dispensed in the same manner.

Pills of Trimethylamine Hydrochlor.—Hydrochlorate of trimethylamine has been much prescribed in a pilular form just recently. This substance occurs in crystals which are extremely deliquescent, and in practice it is always better to allow them to completely liquefy in the mortar before attempting to make the mass. Out of several excipients tried, pulv. althææ and magnesia answered the best, the former helping to bind the mass and the latter absorbing the superfluous moisture. The strength usually ordered is 2 grains in each pill; this requires 1½ grain of each of the powders.

Among the scale preparations *ferri et quininæ cit.* and *beberinæ sulph.* are sometimes ordered in pill; syrup is the best excipient for the former, and glycerin for the latter.—Pharm. Jour. and Trans., Dec. 3, 1887, 471-472.

Pills—Practical Methods of Coating.—Mr. A. C. Klucker gives some practical methods of coating pills with elm bark, paraffin, and cacao-butter. The

Coating with Elm Bark is accomplished by slightly moistening the well-rounded, firm pills, with a little dilute syrup, and rolling them in *very finely* powdered elm bark, drying, and repeating the operation once. In this way the pills are about the size of sugar-coated pills, but have the advantage of being swallowed more easily.

Coating with Paraffin is readily done by rolling them in paraffin barely melted, and polishing them in a pill-silverer, or round-bottomed flask, until the paraffin sets.

Coating with Cacao-butter is accomplished in the same way, but the melting point of the fat is too low for summer pills. A mixture of paraffin and cacao-butter does not give a nice finish. White wax, though not tried, may possibly answer better.—Western Drugg., June 1888, 202-203; from Proc. Ills. Pharm. Assoc., 1888.

Cacao-Coated Pills—Process.—A writer in "J. de Phar. de Lisbon" gives the following process for coating pills with cacao butter: The fat is melted with gentle heat; the pills are rapidly agitated in it, and afterward in powdered starch, in which they are left to cool. The covering of cacao preserves the components of the pills against the action of air and light, and prevents the evaporation of volatile substances.—Bull. gén. de thérap., Jan. 15, 1888.

Pill Coating—Various Methods.—Mr. E. Dieterich gives some practical directions for coating pills with different materials which may possess some useful points of information.

Gelatin coating is accomplished most quickly by introducing 100 dry pills into a rather large warm capsule containing 2.5 gm. of a warm 10 per cent. solution of gelatin, rolling them about in this as brief a time as possible, observing that the mass is uniformly distributed over them, then transferring them to a flat tinned-iron plate coated with a few drops of oil, taking care that the pills do not touch each other. After drying at the ordinary temperature, the process is repeated once.

Cacao coating is accomplished by rolling 100 dry pills in 1 gram of melted cacao butter contained in a uniformly warmed, rather large capsule—the pills being rolled about quickly and in large circles. When cooled, the process is repeated once.

Resin Coating.—The resin solution is made by dividing 5 parts each of mastic and Sumatra benzoin in 10 parts of absolute alcohol and ether. 100 dry pills are then put into a large porcelain capsule, 5 gm. of the resin solution poured over them, and the pills are rotated as rapidly as possible until they separate from each other. When dry, after suitable exposure, the process is repeated once.

Collodion Coating is accomplished in the same manner, substituting a mixture of 1 part of collodion and 2 parts of ether for the resin solution.

Sugar Coating.—Small quantities are expeditiously and well coated in the following manner: Put 100 dry pills into a large capsule containing 1 gm. of a mixture of equal weights of mucilage and water, roll them about until they are uniformly moistened, then gradually add, with constant rolling, portions of a mixture of 40 parts each of sugar and starch, and 20 parts of whitest acacia, until they cease to adhere to each other. Repeat this process, then roll the pills in a capsule containing 0.5 gm. of powdered talcum until the coating becomes glossy. When the pills are dry, remove all superfluous talc by rubbing them with a clean cloth.—Amer. Drugg., Dec. 1887, 222, from "Neues Pharm. Manual."

Quinine Pills—Estimation of Quinine.—Mr. H. W. Snow, in view of the fact that the presence of gelatin, gum, etc., in pills makes it difficult to obtain all the quinine by any direct process of washing out with an immiscible solvent without first removing these substances, suggests a process, which is quite circumstantial, whereby he secures a solution from which gelatin, gum, sugar, etc., are completely eliminated without fear of the loss of quinine. This can then be removed from the solution by the usual methods. The following is a brief outline of the process, the details of which must be consulted in the author's original paper. The pills are thoroughly disintegrated and dissolved in a globular flask containing water, by the aid of dilute sulphuric acid, powdered pumice and No. 4 bird-shot and heat. The mixture, having cooled, is rendered slightly alkaline, an excess of equal parts of stronger ether and stronger alcohol is added and the mixture extracted with this menstruum—a process that is easily accomplished, since the gelatin, gum, etc., adhere readily to the pumice and shot, leaving the supernatant liquor clear. The ether-alcohol solution is evaporated, the residue dissolved in successive portions of water acidulated with sulphuric acid, and washed in a separator once with chloroform. It is then rendered alkaline and shaken out with repeated portions of chloroform until all the quinine is removed, and the chloroform solution is then evaporated, dried, and weighed as quinine.—West. Drugg., Nov. 1887, 367–368.

Aconitine Granules—Preparation.—Messrs. Benoit and Champigny, in view of the extremely powerful action of *aconitine* or *digitalin*, and the risks attending any inaccuracy in dispensing them, recommend to dissolve these substances in suitable solvents, and to triturate the solution with milk-sugar, and a small quantity of harmless coloring matter, which will enable the eye to distinguish when the triturated powder has become perfectly uniform. For nitrate of aconitine the authors recommend boiling water as solvent; for the alkaloid aconitine, or for digitalin, they recommend chloroform. To guard against inaccuracies in weighing, the authors recommend to weigh out never less than one centigram, and to make enough pills of the desired strength to consume the whole amount weighed out, though several hundred may have to be made at one time. They give the following formula: Dissolve 0.01 gm. (1/6 grain) of nitrate of aconitine in 1 gm. of boiling water, and pour the solution, drop by drop, upon 2 gm. (30 grains) of sugar of milk, constantly triturating. Rinse the tube in which the solution had been made with a few drops of hot water, which is to be added to the mass in the mortar. Then gradually incorporate 2 gm. (30 grains) more of milk sugar, then 1 gm. (15 grains) of powdered acacia, and make a suitable mass with the excipient. Divide the mass into 100 granules (each containing 0.0001 gram) 1/600 grain) and keep them in a dry well-stoppered bottle. The excipient recommended by the authors is the officinal (codex) "mellite" (4 p. honey, 1 p. water) to which 10% of glycerin is to be added.—Amer. Drugg., June 1888, 112; from Jour. de Pharm., April 1888, 406.

Pil. Ferri (Blaud)—B. P. C. Formula.—Take of sulphate of iron, 60 grains; carbonate of potassium, 36 grains; Sugar, in powder, 12 grains; tragacanth, in powder, 4 grains; glycerin, 2½ minims; distilled water, 2½ minims. Reduce the sulphate of iron to fine powder, add the sugar and tragacanth, and mix intimately. Finely powder the carbonate of potassium in another mortar, and thoroughly incorporate with it the glycerin and water. Transfer this to the mortar containing the sulphate of iron, beat thoroughly until the mass becomes green and assumes a soft pilular consistence, and divide into twenty-four pills.

Each pill contains about 1 grain of ferrous carbonate.—Yearbook of Pharm., 1887, 589.

Blaud's Pills—Improved Formula.—Mr. Otto G. Klein recommends the following formula, the principal features of which consist in the use of dried sulphate of iron and pure carbonate of potassium prepared from cream of tartar:

℞.	Ferri sulph. exsiccat.,	
	Kal. carbon. e tartaro	āā ʒj.
	Pulv. tragacanth,	
	Pulv. acaciæ	āā gr. x.
	Syrup sacchar., q. s. (about ʒj.)	

The ingredients must be well triturated before admixture, and the mass well kneaded after the addition of syrup in portions, so as to avoid too much of the latter.—D. A. Apoth. Ztg., Feb. 15, 1888, 310.

Blaud's Pills—Another Formula.—Mr. Jos. W. England adds another to the many formulas and suggestions for making "Blaud's Pills," as follows:

Ferrous sulphate, exsiccated,	
Sodium bicarbonate	āā gr. xviii.
Water	♏xii.
Powdered althæa.	gr. xii.
Glycerin, q. s.	
Make into xii pills.	

Put the salts into a porcelain mortar, add the water and allow them to stand till effervescence ceases; triturate to dryness, add the marsh-mallow powder, then the glycerin, and form a mass; enclose in gelatin capsules. The chemical decomposition is expressed by the following formula:

$$FeSO_4H_2O+2NaHCO_3=FeCO_3+Na_2SO_4+2H_2O+CO_2.$$

The advantage that this formula possesses over the older ones is that the conversion of the ferrous sulphate into carbonate is complete before forming the pill; secondly, that there is no excess of moisture, through the subsequent evaporation of which the mass becomes hard: and thirdly, that the employment of althæa gives body to the mass, whilst the glycerin tends to prevent hardening, a result which enclosing them in gelatin capsules also assists. Care must be taken that the complete conversion of the entire mass into carbonate has taken place, or the escape of carbonic acid would destroy the pills or render them full of fissures and unsightly.—Amer. Jour. Pharm., April 1888, 173–174.

Pills of Reduced Iron—Commercial Quality.—Mr. Henry McDavit examined four samples of commercial pills of reduced iron, mainly with the view of ascertaining whether the iron would answer to the tests given in the United States Pharmacopœia. When dissolved in diluted sulphuric acid, the hydrogen gas given off was nearly odorless. A sufficient number of pills, corresponding to ten grains of reduced iron, was disintegrated in water, the undissolved portion collected upon a filter, and this was then introduced into a flask containing the quantity of potassium iodide and iodine required by the Pharmacopœia. The compressed pills, not being disintegrated by digestion with water, were powdered and treated as stated. None of the samples yielded a green-colored liquid.

Of two samples of reduced iron tested in the same manner, one did not give a green colored solution; but the other did, and therefore contained at least eighty per cent. of metallic iron. Pills made of the latter sample showed the same behavior; but it is not stated whether they were kept on hand for any length of time before testing them.—Amer. Jour. Pharm., March 1888, 136.

Phosphorus Pills—Satisfactory Process.—Mr. Fischer finds the following method the most satisfactory one for making phosphorus pills: Place the prescribed amount of phosphorus in a test tube containing a small quantity of chloroform, and carefully apply heat until the phosphorus is all dissolved. Add the solution of phosphorus with constant stirring to a melted mass consisting of two parts yellow wax and two parts cocoa butter, taking care to keep the mixture warm until the chloroform is all expelled. After cooling mix the mass with one part of carbonate of magnesium, divide into the required number of pills, and coat them with gelatin.—Pharm. Zeitg. f. Russ., 1887, 674.

Lithium Pills—Formula.—Mr. P. Vigier proposes lithium pills to replace a similar composition in fluid form recommended by Martineau for glycosuria of arthritic origin. The formula is: Carb. lithium 0.10 gm.; arsen. sodium, 3 mgm.; ext. gentian 0.05 gm.; for one pill to be taken night and morning, and continued until the sugar has disappeared from the urine.—Amer. Jour. Pharm., Aug. 1887, 400; from L'Union Pharm., June 1887.

Phosphate of Copper Pills—Formula.—Dr. Luton recommends phosphate of copper in the treatment of phthisis, in form of mixtures (which see under "Mistura") and in form of pills, as follows: Acetate of copper, neutral, 0.01; phosph. sodium, cryst., 0.05; liquorice root, glycerin, āā q. s.—Amer. Drugg., June 1888, 114; from L'Union Pharm.

Creasote and Tolu Capsules—Use in Phthisis.—Dr. Sommerbrodt has successfully used capsules of creasote and tolu balsam in the earlier stages of phthisis. Each capsule contains 0.05 gm. (¾ grain) of creasote and 0.02 gm. (⅓ grain) of balsam of tolu. With due caution in the beginning of the treatment, the system becomes quickly accustomed to the medicine. Some patients have taken from 600 to 2000 of such capsules during the continuance of the treatment.—Amer. Jour. Pharm., Sept. 1887, 440; from Berl. Klin. Woch., No. 15, 1887.

Pills of Terpinol—Formula.—Mr. Tanret gives the following formula for pills of terpinol: Terpinol, benzoate of sodium, of each, 1 gram;

sugar, q. s. Make 10 pills. Dose 5 to 10 daily.—Nouv. Rem., Dec. 8, 1887.

PULVERES.

Vegetable Powders—Percentage of Moisture Lost and Absorbed under Certain Conditions.—Dr. G. Vulpius has determined the moisture in a large number of powdered vegetable drugs under different conditions, and communicates the results in a table, as given below, to which the following may serve as explanation: Column *A* shows the loss in weight on exposing the powder for 24 hours in a shallow capsule placed in the drying closet kept at a temperature of 40° C.; column *B.*, the additional loss when heated for 24 hours more at 100° C.; column *C* the total loss in weight; column *D* the increase in weight of the original powder when exposed for 24 hours in a cool, moderately moist place; while column *E* shows the extremes between the powder dried at 100° C. (212° F.) and the powder exposed as under *D* to moisture.

Name of Powdered Drug.	*a.* Loss in Weight at 40°.	*b.* Additional Loss in Weight at 100°.	*c.* Total Loss in Weight.	*d.* Gain in Weight.	*e.* Total Moisture of C and D.
Aloes.	2 per cent.	5 per cent.	7 per cent.	4 per cent.	11 per cent.
Amygdalæ Excort. . . .	5 “	5 “	10 “	4 “	14 “
Cort. Cinch. Calisaya . .	4 “	7 “	11 “	5 “	16 “
Cort. Cinch. Fusc . . .	4 “	5 “	9 “	5 “	14 “
Cort. Cinch. Succirub. .	4 “	5 “	9 “	3 “	12 “
Cort. Cinnamomi	5 “	6 “	11 “	3 “	14 “
Flor. Chrysanth. Dalm. *a*	5 “	5 “	10 “	5 “	15 “
b	4 “	6 “	10 “	6 “	16 “
c	5 “	4 “	9 “	6 “	15 “
Flor. Cinæ *a*	5 “	4 “	9 “	7 “	16 “
b	4 “	4 “	8 “	9 “	17 “
Fol. Belladonnæ	5 “	5 “	10 “	3 “	13 “
Fol. Digitalis *a*	4 “	4 “	8 “	15 “	23 “
b	6 “	4 “	10 “	17 “	27 “
c	2 “	4 “	6 “	18 “	24 “
Fol. Sennæ Alex. *a* . . .	5 “	5 “	10 “	6 “	16 “
b . . .	4 “	6 “	10 “	9 “	19 “
c . . .	4 “	4 “	8 “	7 “	15 “
d . . .	3 “	4 “	7 “	9 “	16 “
Fol. Sennæ Tin *a* . . .	5 “	4 “	9 “	9 “	18 “
b . . .	5 “	5 “	10 “	8 “	18 “
c . . .	5 “	3 “	8 “	6 “	14 “
d . . .	4 “	4 “	8 “	9 “	17 “
Fol. Stramonii	5 “	4 “	9 “	6 “	15 “
Fruct. Anisi *a*	6 “	6 “	12 “	2 “	14 “
b	5 “	5 “	10 “	3 “	13 “
Fruct. Cardamomi . . .	6 “	6 “	12 “	3 “	15 “
Fruct. Foeniculi *a* . . .	7 “	5 “	12 “	4 “	16 “
b . . .	5 “	5 “	10 “	1 “	11 “
c . . .	4 “	5 “	9 “	2 “	11 “
d . . .	6 “	5 “	11 “	2 “	13 “

Name of Powdered Drug.	*a.* Loss in Weight at 40°.	*b.* Additional Loss in Weight at 100°.	*c.* Total Loss in Weight.	*d* Gain in Weight.	*e.* Total Moisture of C and D.
Fruct. Coriandri	5 per cent.	4 per cent.	9 per cent.	3 per cent.	12 per cent.
Gum. Arabic. *a*	6 “	7 “	13 “	10 “	23 “
b	5 “	8 “	13 “	10 “	23 “
c	6 “	7 “	13 “	11 “	24 “
Herb. Thymi	4 “	5 “	9 “	7 “	16 “
Opium	5 “	2 “	7 “	4 “	11 “
Rad. Althææ *a*	6 “	7 “	13 “	6 “	19 “
b	7 “	3 “	10 “	10 “	20 “
c	6 “	6 “	12 “	4 “	16 “
d	5 “	4 “	9 “	6 “	15 “
Rad. Ari	7 “	6 “	13 “	6 “	19 “
Rad. Colombo	7 “	5 “	12 “	6 “	18 “
Rad. Gentianæ	6 “	5 “	11 “	10 “	21 “
Rad. Ipecacuanhæ . . .	4 “	7 “	11 “	7 “	18 “
Rad. Liquiritiæ *a* . . .	5 “	4 “	9 “	8 “	17 “
b i . . .	6 “	3 “	9 “	10 “	19 “
b ii . . .	4 “	5 “	9 “	8 “	17 “
c i . . .	4 “	4 “	8 “	4 “	12 “
e ii . . .	5 “	4 “	9 “	6 “	15 “
c iii . .	4 “	4 “	8 “	5 “	13 “
d i . . .	6 “	4 “	10 “	5 “	15 “
d ii . . .	5 “	4 “	9 “	9 “	18 “
Rad. Rhei *a*	3 “	4 “	7 “	8 “	15 “
b i	6 “	4 “	10 “	6 “	16 “
b ii	5 “	4 “	9 “	10 “	19 “
c	5 “	4 “	9 “	11 “	20 “
d	3 “	2 “	5 “	7 “	12 “
e i	5 “	3 “	8 “	4 “	12 “
e ii	4 “	4 “	8 “	4 “	12 “
Rhizoma Iridis *a* . . .	6 “	5 “	11 “	11 “	22 “
b i . . .	5 “	4 “	9 “	12 “	21 “
b ii . .	5 “	6 “	11 “	8 “	19 “
b iii . .	6 “	5 “	11 “	11 “	22 “
c . . .	5 “	4 “	9 “	9 “	18 “
Rhizoma Zedoariæ . . .	6 “	5 “	11 “	4 “	15 “
Secale Cornutum *a* i. . .	6 “	3 “	9 “	10 “	19 “
a ii . . .	6 “	3 “	9 “	9 “	18 “
b . . .	5 “	5 “	10 “	11 “	21 “
c . . .	11 “	3 “	14 “	10 “	24 “
Sem. Sinapis	6 “	3 “	9 “	1 “	10 “
Tragacantha	8 “	8 “	16 “	9 “	25 “
Tubera Jalapæ	6 “	4 “	10 “	6 “	16 “
Tubera Salep *a*	6 “	6 “	12 “	7 “	19 “
b	6 “	7 “	13 “	8 “	21 “
c	6 “	7 “	13 “	11 “	24 “

The results of the above table give the conviction that an intentional and extensive increase in weight of vegetable powders with moisture is not practiced, for all the powders examined increased in weight when exposed in a cool room to moist atmosphere, the quantities varying between 1 and 18 per cent., and being dependent upon the hygroscopicity of the particular powder: those containing fixed or volatile oils being least hygroscopic, while the largest amounts of moisture were absorbed by drugs containing mucilage or similar substances.

On the other hand, it must be noted that all the powders lost in weight even by the moderate use of the drying closet (from 2 to 11 per cent.) while the total moisture in most cases considerably increases this. The remedy consists in drying all powders at a moderate temperature, with the exception of those containing especially volatile components, which do not as a rule retain as much moisture, and on the other hand are not so liable to injury from the moisture retained by them.—Arch. d. Pharm., Dec. 1887, 1044–1049.

Powdered Camphor—Method of Preservation in Finely Divided Condition.—Mr. Joseph W. England, after reviewing the different expedients for powdering camphor and securing its retention of that condition, draws attention to a method which has given admirable results. The camphor is reduced to pulverulency in a mortar, with the aid of a small quantity of a solvent, such as, for example, alcohol or ether, triturating to thorough dryness, and then adding five per cent. of petrolatum, admixing well. The product is a finely divided yellowish tinted powder; strongly characteristic in odor; quickly dissolving when placed on the tongue, with a very warm, pungently bitter taste, and showing all the other properties of the drug. The proportion of the unctuous paraffin solid present, harmless in itself, is too small to have any influence upon the dosage, and yet sufficiently large to prevent subsequent crystallization. On standing for a short time, moderate caking takes place, but no crystallization ensues. If a lump be now placed on the hand, and slight pressure applied, it readily breaks down into a fine, velvety powder. It is, therefore, admirably adapted for general use in powders despite its caking tendency, and is especially applicable in the extemporaneous preparation of camphor ointments or camphoraceous suppositories.—Amer. Jour. Phar., Dec. 1887, 598–599.

Saccharol of Cinchona—Criticism as to Merits and Desirability of this Preparation.—Prof. Frederick B. Power has prepared the so called saccharol of cinchona in strict accordance with the directions of Mr. Vigier (see Proceedings 1887, 63), using good red cinchona bark. The product has a brownish-red color, and retains the consistence of a somewhat soft extract. It dissolves only incompletely in water, and a perfectly clear solution is not obtained even by the addition of a considerable excess of acid, which shows that the insoluble portion does not consist of alkaloids. The author does not consider that the "saccharolé" is a desirable addition to the cinchona preparations at present in use, any more than an abstract made after the officinal directions with 95 per cent. alcohol; though the latter preparation is far more elegant, retaining its pulverulent condition, and probably a more accurate representative of the bark. Moreover, the abstract is just double the strength of the "saccharole," which represents the bark weight for weight.—Pharm. Rundschau, Sept. 1887, 205–207.

Ferri Oxidum Saccharatum Solubile—Improved Formula.—Mr. E. Dieterich communicates the following improved formula for making soluble saccharated oxide of iron. Heat together 86 parts of solution of oxychloride of iron (Pharm. Germ.) and 150 parts of syrup in a capsule on the water bath, gradually add, while stirring, 7.5 parts of solution of soda, and evaporate to dryness. Reduce the mass to powder and incorporate with it enough sugar to make 100 parts. The product is a light brown powder, scarcely ferruginous to the taste, easily soluble in one-half its weight of water, and soluble in milk and liquids containing albuminoids without altering them. 100 parts contain 3 parts of iron. It differs from the corresponding preparation of the Germ. Pharm. by its greater solubility. The author also gives a formula for

Ferri Oxidum Dextrinatum Solubile.—Dissolve 80 parts of pure (yellow, soluble) dextrin in 80 parts of distilled water, add 290 parts of solution of oxychloride of iron (Pharm. Germ.), filter, and wash the filter with a little water. Heat the filtrate in a capsule to between 70° and 90° C., gradually add, while stirring, 25 parts of solution of soda (Pharm. Germ.), evaporate to dryness, reduce to powder, and mix with enough pure dextrin to make 100 parts of product. It possesses a dextrin-like, scarcely ferruginous taste, is chocolate-brown in color, soluble in 1½ times its weight of water, and soluble also in milk and other albuminoid liquids without altering them. It contains 10 per cent. of iron.—Amer. Drugg., March 1888, 51; from Pharm. Centralhalle.

Saccharated Ferric Oxide—Necessity of the Presence of Alkali to Render it Soluble.—The experiments of Mr. W. Strohmeyer having shown: 1, that ferric hydroxide dissolves in sugar solution in small quantity, varying somewhat with the conditions of the process; 2, that the solubility of ferric hydroxide is increased with the increase of the quantity of sugar in the aqueous solution; and 3, that the solubility of ferric hydroxide in sugar solution is augmented by the addition of caustic potassa. Prof. Ernst Schmidt has made further experiments, which show: 1, That the brown granular precipitate produced by boiling water in the solution of a ferric salt, containing sugar and rendered alkaline by caustic soda, may be almost absolutely freed from sodium, but not from sugar, by washing with boiling water; and with hydrochloric acid yields a brown red solution, passing gradually into the yellowish brown of ferric chloride; 2, that ferric saccharates, suitably mixed with sugar, must contain a certain amount of alkali, possibly as sodium saccharate, in order to yield clear solutions with water; the amount of Na_2O necessary for this purpose is rather less than 1 per cent. of the Fe_2O_3 present.

The chemical reactions, when following the process of the Phar. Germ., may be explained thus: Sodium carbonate precipitates from ferric solutions, ferric hydrate containing soda, which with NaO and sugar forms a water-soluble ferric saccharate; boiling water precipitates from the solution ferric saccharate of variable composition and soluble in water; if by washing with water the amount of NaO has not been decreased to less than about 1 Na O for 100 Fe_2O_3. then on the addition of sugar and drying, a water-soluble ferric saccharate with excess of sugar is obtained. Archiv d. Phar. Feb. 1888, 137–154.

Saccharated Oxide of Iron—Preparation and Composition.—Mr. Traub agrees with Dr. Hayes that saccharated oxide of iron represents a combination of ferric saccharate and sodic saccharate, in which the latter determines the solubility of the former. In presence of an excess of soda, a relatively smaller amount of sugar is needed to hold the ferric oxide; otherwise a large quantity is needed. The preparation is made by dissolving 100 gm. perchloride of iron in 500 ccm. of water, into which is poured a solution of 85 gm. crystallized sodium carbonate in 500 ccm. of water. The precipitate is washed, pressed and mixed with 100 gm. powdered sugar, to which has been added, 1.50 gm. of caustic soda (in plaques) dissolved in 3 gm. of water. The mixture is then evaporated to dryness. The mass is now pulverized, the quantity of iron determined, and a q. s. of powdered sugar added. This saccharate is very soluble. The oxide precipitated by ammonia is not soluble with sugar and soda.—Amer. Jour. Pharm., Jan. 1888, 15; Pharm. Centralh., 1887.

Salol Dusting Powder—Use in Facial Erysipelas.—A dusting powder of salol has been used by Dr. Georgi in facial erysipelas. The powder consists of equal parts of salol and talc. It was also found useful for removing the bad odor in ozæna, the insufflation being repeated every two hours.—Amer. Jour. Pharm., Sept. 1887, 441; from Berl. klin. Woch., 1887, No. 9.

SAPONES.

Transparent Soaps—Preparation of a Good Article.—"The Hospital" observes that some transparent soaps are very good, some very bad. Many of the bad transparent soaps are prepared from impure materials, and the translucency is secured by the addition of sugar, some specimens containing as much as 25 per cent. Good transparent soap is prepared from ordinary soap of good quality, which is cut into shavings, dried, and then treated with alcohol, which leaves the soap in a transparent condition on evaporation. There are two advantages in this treatment. First, when soap is cut into shavings, any free (caustic) soda tends to get less by contact with air. Second, the treatment with alcohol removes all excess of soda, and thus renders the soap better suited for use on the skin.—Amer. Drugg., April 1888, 76.

Biniodide of Mercury Soap—A New Antiseptic.—Mr. John Thomson has experimented with a number of mercuric salts with a view to preparing an antiseptic soap, but found only one of these to resist decomposition when introduced into soap. This salt was red iodide (biniodide), which has long been known to be more powerfully antiseptic than even the bichloride. Biniodide of mercury combines with soap of almost any kind without in any degree losing its antiseptic properties. The

Antiseptic Soaps prepared by the author, containing from 1 to 3 per cent. of biniodide of mercury, dissolved in iodide of potassium, were tested by several bacteriologists and were found to be most efficient. It has been tried in the treatment of eczema with most marked success, especially where the irritation has been produced by the fermentation of accumulated secretions. It has also been used in parasitic skin diseases, such as favus and ringworm, with marked success.—Amer. Drugg., June 1888, 103; from Jour. Soc. Chem. Industry (Edinburgh), 1888, 192.

Mercurial Potash Soap—Use as a Sorbefacient.—Mr. Svetukhin finds a preparation termed *sapo kalinus hydrargyrosus* made by mixing metallic mercury, mercurial ointment, caustic potash, and olive-oil in certain proportions—the resulting soap containing a third of its weight of mercury—an advantageous application for promoting the absorption of pleuritic effusion. It is said to be more easily rubbed in than mercurial ointment, less irritating to the skin, and not so rapidly productive of stomatitis. From half a drachm to a drachm is agitated with hot water, so as to form a good froth, and lightly rubbed into the skin. In cases of simple watery effusion, an effect may be detected after from six to ten inunctions, and after twenty the water is usually found to have wholly disappeared.—Amer. Jour. Pharm., Dec. 1887, 604; from N. Y. Med. Jour., Aug. 27, 1887.

SPIRITUS.

Spirit of Ether—Use in Connection with Opium.—Dr. Auld observes that spirit of ether is a powerful stimulant of secretion, and he therefore recommends it for preventing the disagreeable after-effects of opium, generally prescribing equal parts of the spirit of ether and of tincture of opium.—Amer. Jour. Pharm., Nov. 1887, 555; from "Lancet."

SUCCI.

Lime Juice—Assay of Commercial Samples.—Mr. W. M. Eames has examined eight commercial samples of lime juice, and found them to contain respectively 3.902, 5.016, 4.454, 5.202, 4.362, 4.454, 5.772 and 4.144 per cent. of real citric acid. The total acidity, calculated as citric acid, amounted to 4.553, 4.634, 4.228, 5.691, 7.317, 5.691, 8.130, and 8.211 per cent. respectively. None of the samples were adulterated.—Pharm. Rec., March 1, 1888, 73.

SUPPOSITORIA.

Suppositories—Improved Shape.—Dr. S. G. Dixon calls attention to a new form of suppository which differs in the broader end being terminated in a cone, so that the whole represents a double cone, of which the upper is only half as long as the lower. The upper or shorter and broader end is inserted first, and the suppository, by reason of its shape, is easily retained and forced upwards by the sphincter muscle.—Therap. Gaz., 1888, 241.

Suppositories—Addition of Soap to Facilitate Preparation.—Mr. Leboutte states that suppositories are easily and quickly made by the following process: The cacao butter in thin slices is bruised in a mortar with the medicaments, to which are added a small quantity of medicinal soap and a few drops of water. The mass readily becomes homogeneous, and the suppositories retain the necessary consistency.—Jour. de Pharm. et de Chim., Sept. 1887.

Peptone Suppositories—Preparation, etc.—Dr. Sauter has used peptone suppositories, which are made by incorporating 1.6 gram of peptone with sufficient cacao butter. Adults use two such suppositories three or four times a day, an enema being previously used. The suppositories require to be kept cool to prevent rancidity.—Amer. Jour. Pharm., Nov. 1887, 555.

Gelatin Bougies—Peculiar Preparation—A species of bougies which have the excellent qualities of suppleness and elasticity, united to the rigidity necessary for use in tortuous canals and fistulas, are described under the name of

Antrophores de Francke.—One contains 4 per cent. of boric acid; one has 2 per cent. sulphate of copper; one, 5 per cent. of sulphate of thalline; one, 5 per cent. of sulphate of zinc; three have, respectively, 30, 5, and 2 per cent. of iodoform, and others contain from 2 to 5 per cent. of hydrochlorate of cocaine. The base is formed of a mixture of gelatin and glycerin. The medicated mass is supported by a wire spiral in its centre, the coils of which lie closely together; the composition is massed around this spiral, to which it readily adheres until dissolved in the passages into which it has been introduced. The bougies are made of 7, 10, and 15 cm. in length, and those for catarrh of the prostate are 22 cm. Bougies for the latter purpose are covered only to the extent of 2 cm. The mass used for this purpose contains 2 per cent. nitrate of silver and 5 to 10 per cent. cocaine. Cocaine antrophores are used to deaden the pain likely to be felt from explorations of the urethra. Those of sulphate of zinc, thalline, or resorcin, are used for blennorrhagia. For catarrh of the cervico-uterine canal the bougies of 2 per cent. nitrate of silver or 30 per cent. of iodoform are found excellent. Fistulæ and urethral chancres are best treated with the 30 per cent. iodoform, or 3 per cent. phenic acid antrophores.—Amer. Jour. Pharm., Nov. 1887, 558; from Jour. de Phar. d'Als.-Lorr.

SYRUPI.

Syrups—Formula of the B. P. C.—The following formulas for syrups are given in the "Unofficinal Formulary" of the Br. Pharm. Conference:

Syrupus Apomorphinæ Hydrochloratis, B. P. C.—Take of hydrochlorate of apomorphine, 5 grains; dilute hydrochloric acid, 2 fluiddrachms; rectified spirit, 7 fluiddrachms; distilled water, 7 fluiddrachms; syrup, 18 fluidounces. Mix the rectified spirit and distilled water, dissolve the hydrochlorate of apomorphine in the mixture by agitation; add the hydrochloric acid, and mix with the syrup.

Syrupus Butyl-chloral, B. P. C.—Take of hydrate of butyl-chloral, 320 grains; syrup, sufficient to produce 1 pint. Dissolve the hydrate of butyl-chloral in the syrup previously made hot.

Syrupus Calcii, Manganesii et Potassii Hypophosphitum, B. P. C.—Take of hypophosphite of calcium, 320 grains; hypophosphite of manganese, 160 grains; hypophosphite of potassium, 160 grains; boiling distilled water, 4 fluidounces. Rub together in a hot mortar till nearly dissolved, and add syrup sufficient to produce 1 pint.

Syrupus Cascaræ Sagradæ, B. P. C.—Take of liquid extract of cascara sagrada (see "Fluid Extracts"), 4 fluidounces; liquid extract of licorice, 3 fluid ounces; carminative tincture (see "Tinctures") 2 fluiddrachms; syrup, sufficient to produce 1 pint. Mix.

Syrupus Ferri Hypophosphitis, B. P. C.—Take of sulphate of iron, 232 grains; distilled water (cold), 2 fluid ounces; dissolve. Then take of hypophosphite of calcium, 160 grains; hypophosphorous acid, sp. gr. 1.136, 2 fluid drachms; distilled water (cold), 4 fluid ounces; dissolve; mix the two solutions in a closed bottle, and after standing one hour, filter the mixture on to sugar, 15 ounces. Wash the precipitate with distilled water sufficient to produce 1 pint. Dissolve without heat. This syrup should be kept in perfectly full bottles, and syphoned off bright when required.

Syrupus Ferri Phosphatis Compositus, B. P. C.—Take of iron wire, free from rust, 37½ grains; concentrated phosphoric acid, sp. gr. 1.5, 1 fluid ounce; distilled water, 5 fluid drachms. Put these into a glass flask, so that the liquid completely covers the iron wire, plug the neck with cotton wool, and heat gently till dissolved. Add this solution to the following when the latter has cooled: Precipitated carbonate of calcium, 120 grains; concentrated phosphoric acid, 4 fluid drachms; distilled water, 2 fluid ounces; mix and add bicarbonate of potassium, 9 grains; phosphate of sodium, 9 grains, filter and set aside. Then take of cochineal, 30 grains; distilled water, 7½ fluid ounces; boil for fifteen minutes and filter, pouring over the filter a sufficient quantity of distilled water to produce 7 fluid ounces of filtrate. To this add refined sugar, 14 ounces. Heat till dissolved, and strain. When cold add the former filtrate set aside, and a sufficient quantity of distilled water to make the whole measure 1 pint. Thus made, the syrup will contain in each fluid drachm about ½ grain of phosphate of iron and $\frac{4}{5}$ grain of phosphate of calcium, with small quantities of the phosphates of potassium and sodium. It should be kept in bottles quite full.

Syrupus Ferri Quininæ et Strychninæ Phosphatum, B. P. C.—Take of strychnine, in powder, 5 grains; concentrated phosphoric acid, sp. gr. 1.5, 75 minims; distilled water, 225 minims; dissolve, and add phosphate of quinine, 120 grains; dissolve by the aid of a gentle heat, and add syrup of phosphate of iron sufficient to produce 1 pint. Mix thoroughly. Each fluid drachm contains 1 grain of phosphate of iron, ¾ grain of phosphate of quinine, and $\frac{1}{32}$ grain of strychnine.

Syrupus Hypophosphitum Compositus, B. P. C.—Take of quinine (alkaloid), 20 grains; strychnine, 1 grain; distilled water, ½ fluidounce; hypophosphorous acid, sp. gr. 1.136, 1 fluid drachm, or a sufficient quantity. Dissolve, filter, and add syrup sufficient to produce 5 fluidounces. Then add syrup of the hypophosphites of calcium, manganese and potassium, 5 fluidounces; syrup of hypophosphite of iron, 10 fluidounces. Mix to produce 1 pint of syrup. Each fluid drachm contains $\frac{1}{160}$ grain of strychnine and $\frac{1}{8}$ grain of quinine.—Yearbook of Pharm., 1887, 590–593.

Syrup of Ferrous Hypophosphite—Formula and Process.—Mr. H. C. Everson, referring to the formula recommended by the Unofficinal Formula Committee to the Brit. Pharm. Conference, suggests the following as a more satisfactory formula for preparing the syrup of ferrous hypophosphite: Take of pure and fine iron wine, 49 grains; hypophosphorous acid, sp. gr. 1.136 (free from lime), f.℥j; water, f.℥ix; sugar, 15 ounces. Boil the iron wire in the mixture of acid and water till dissolved, filter hot on to the sugar, and stir till solution is effected. The formula criticized by the author directs the preparation of the ferrous hypophosphite by double decomposition.—Pharm. Jour. and Trans., Dec. 24, 1887, 517.

Syrup of Phosphate of Iron, Quinine and Strychnine, U. S. P.—*Undesirability of this Preparation.*—Mr. C. E. Foote reviews the formula for this preparation, as well as the necessity for its incorporation into the Pharmacopœia. He concludes that the preparation, which was evidently admitted into the Pharmacopœia as a concession to the so-called elegant pharmacy, is unstable, disagreeable to the taste, and not at all necessary, and should be dismissed.—Pharm. Era, Sept. 1887, 321–322.

Simple Syrup—Process of Cold Percolation.—Objection having been found to simple syrup made by the process of cold percolation on the ground that it acquired an unpleasant odor and deposited a blue substance, Mr. T. Ashby Miller investigated the subject, and finds the cause of these objectionable results not to be due to the process itself, but to the presence of ultramarine. When using granulated sugar there was invariably a deposit of ultramarine, while when "A" sugar was used the syrup proved satisfactory, since this is the refined sugar before ultramarine is added. The only objection to the process of cold percolation is the length of time necessary to finish the syrup; but if a funnel is used instead of a percolator, it takes very little more time than the ordinary method, while the little time lost is more than compensated by the advantages gained.—Proc. Virg. Pharm. Assoc.,. 1888, 61–62.

Syrup of Tolu—Objection to the Officinal Process.—Mr. H. T. Eberle, among other officinal syrups, criticizes the officinal formula for syrup of tolu, regarding it objectionable. He finds that the formula proposed by Mr. Fournier (see Proceedings 1885, 89), gives the best results of any tried, this method consisting in mixing simple syrup with a specially prepared solution (alcoholate) of tolu.—Pharm. Era, March 1888, 91.

Referring to Mr. Eberle's above remarks on syrup of tolu, Mr. Edw. Claassen observes that, while he has no doubt that Mr. Fournier's formula will give a nice-looking syrup, it is not the syrup wanted by the Pharmacopœia, which should be free from alcohol, should contain the cinnamic and benzoic acid of the tolu in a free state, and is altogether a powerful preparation. An improvement on the officinal process, whereby a stronger preparation may be secured, is suggested by Mr. Claassen as follows: Put the necessary quantity of pulverized sugar and water to make the syrup, together with the prescribed quantity of tolu into a suitable tin can, heat to effect the solution of the sugar, and shake the mixture, while hot, occasionally during five minutes. When nearly cold the somewhat turbid syrup is poured off from the resin.—Ibid., May 1888, 169.

Syrupus Aurant. Amar.—Action of Acids and Acid Salts.—Mr. Leprince points out that however carefully syrup of bitter orange* is made, it always contains a certain amount of mucilage which is liable to cause the solidification of its mixtures with many commonly prescribed medicaments, especially the phosphates. He recommends that the syrup be made wholly from the alcoholic extract. It will then, though retaining all of its aroma, remain wholly unaffected by the action of acids.—Monde Pharm., Dec. 20, 1887.

Syrupus Lactucarii—New Process of Preparation.—Mr. Geo. M. Beringer mentions his objections to the processes for the preparation of syrup of lactucarium that have been proposed, including those that have been and are now officinal. He has been preparing the syrup from a fluid extract, or rather, *concentrated tincture* of lactucarium of half the officinal strength: the formula, based upon that of Mr. Lemberger (see Proceedings, 1878, 763) being as follows: Take of lactucarium, 100 gms. Beat it up in an iron mortar with an equal weight of clean sand (the author prefers small pieces of pumice-stone) to a coarse powder, and place it in a large bottle with benzin, 400 c.c. Tightly cork the bottle and allow to macerate for 2 or 3 days with repeated agitation. Decant the lactucarium in a double paper-filter and allow it to drain. Wash the dregs with about 100 or 150 c.c. of benzin and allow the lactucarium to dry by opening out the filter on a slab or a few sheets of porous paper. When dry rub it up in an iron mortar, using a little more sand or pumice, if necessary, and pack lightly in a conical percolator. Cover with a layer of several inches with a menstruum of glycerin, 25 c.c.; water, 75 c.c.; alcohol, 100 c.c. Tightly cork the lower orifice of the percolator and allow to macerate for 24 hours. Then continue the percolation, reserving the first 125 c.c. of percolate. Continue the percolation, using diluted alcohol, until the lactucarium is extracted. Evaporate this tincture in the water-bath at a moderate temperature (about 160° F.) to 75 c.c. and mix with the reserved portion. Filter and add enough diluted alcohol through the filter to make the finished product measure 200 c.c. To prepare the syrup, take of concentrated tincture of lactucarium, 10 gms.; syrup, 90 gms. Mix.

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* The syrup of the "codex" is made by extracting the orange rind with a 6 per cent. alcoholic menstruum.—Rep.

The author also submits the following formula for the syrup: Concentrated tincture of lactucarium, 10 gms.; glycerin, 10 gms.; syrup, 80 gms. Mix.—Amer. Jour. Phar., Feb. 1888, 70–73.

Compound Syrup of Sarsaparilla—New Process of Preparation.—Mr. Isaac Davis, in 1878 (see Proceedings 1879, 110), proposed the preparation of this and other syrups by percolating the drugs, suitably powdered, with simple syrup. Mr. Irvin J. Brandt now suggests a modification of this process by combining the process of dissolving the sugar with that of exhausting the powdered drugs. For the syrup named he proposes the following manipulation: Reduce to a number 20 powder the following drugs: sarsaparilla, 12½ ounces, avoirdupois; guaiacum, 1½ ounces; pale rose, 1 ounce; glycyrrhiza, 1 ounce; senna, 1 ounce; sassafras, ½ ounce; anise, ½ ounce; and gaultheria, ½ ounce. Moisten the powder with a menstruum composed of 1 part of alcohol and 7 parts of water; when thoroughly saturated, transfer to a percolator, pack firmly, cover with a piece of filtering paper; upon this place 50 ounces of sugar, and gradually add more menstruum until the percolate begins to drop; then close the lower orifice, macerate for forty-eight hours, and finally percolate until 3½ pints of syrup are obtained.

Syrupus Scillæ Compositus was made by the same process and with equally good results, a small quantity of ammonia having been added to the menstruum with the view of holding the pertinacious principle of senega in solution.—Amer. Jour. Phar., Jan. 1888, 9-10.

Aromatized Syrup of Licorice—Formula.—Mr. P. E. Hommell communicates the following formula for a "syrup" which he finds an excellent vehicle for disguising the bitterness of quinine. Fluid extract of licorice root, four fluidounces; fluid extract of coriander, sixty minims; fluid extract of fennel, thirty minims; fluid extract of cardamom, sixty minims; fluid extract of anise seed, thirty minims; powdered biborate of sodium, sixty grains; simple syrup U. S. P., q. s., two pints.—Proc. N. J. Pharm. Assoc. 1888, 85.

Aromatic Syrup of Yerba Santa—Formula.—Mr. E. Y. Johnson recommends the following formula for making an aromatic syrup of yerba santa, a fluidounce of which will perfectly disguise 40 grains of sulphate of quinine: Fl. ext. of yerba santa, 1 ounce; carb. magnesia, 6 drachms; refined sugar, 4 ounces; water, 4 ounces; oil of pimenta, 10 drops; oil of cloves, oil of cinnamon, of each, 6 drops. Rub the magnesia and sugar together until thoroughly mixed, then drop in the oils and the fluid extract of yerba santa, and rub until nearly dry. To this add the water, mixing well, and lastly, add a mixture of glycerin, 4 ounces; water, 5 ounces; rub well, pour on a filter and add water to make the filtrate measure 15 fluidounces. In this dissolve by agitation, refined sugar 14 ounces (av.), and add to the whole mixture citrate of potassium, 75 grains, previously dissolved in a little water, and let stand 2 hours. Filter through a wetted filter, returning until it passes clear. The clear, brilliant syrup will not cloud on standing.—Drugg. Circ., April 1888, 78–79.

Syrup of Saccharin—Formula.—Mr. Kügler gives the following formula: Saccharin, 10 grams; sodium bicarbonate, 12 grams; distilled water, 1000 grams.—Jour. de Pharm. et de Chim., March 1, 1888.

TINCTURÆ.

Tinctures—Formulas of the B. P. C.—The following formulas for tinctures are given in the "Unofficinal Formulary" of the Brit. Pharm. Conference:

Tinctura Benzoini Simplex, B. P. C.—Take of benzoin, in powder, 2 ounces; rectified spirit, 1 pint. Macerate for twenty-four hours with frequent agitation, then filter, and add sufficient rectified spirit, if required, to produce one pint.

Tinctura Bryoniæ, B. P. C.—Take of fresh bryony root, rectified spirit, distilled water, of each a sufficient quantity Ascertain the percentage of moisture in the root by drying 100 grains of it over a water-bath. Bruise the remainder, after having calculated the moisture it contains, and reckon this as part of the water to form, with rectified spirit, a mixture equal in strength to proof spirit. Produce a tincture by macerating for seven days of such strength that ten fluidounces shall represent one ounce of the dried root.

Tinctura Carminativa, B. P. C.—Take of cardamom seeds, bruised, 600 grains; stronger tincture of ginger, 1¼ fluidounces; oil of cinnamon, 100 minims; oil of caraway, 100 minims; oil of clove, 100 minims; rectified spirit, sufficient to produce 1 pint. Macerate the cardamoms in fifteen fluid ounces of the spirit for a week, decant, express, and dissolve the oils in the mixed tinctures, making up to one pint with rectified spirit.

Tinctura Convallariæ, B. P. C.—Take of Lily of the Valley (*Convallaria majalis, L.*) flowers and stalks, dried and in No. 20 powder, 2½ ounces; proof spirit, a sufficient quantity. Moisten the powder with a suitable quantity of the menstruum and macerate for twenty-four hours; then pack in a percolator, and gradually pour menstruum upon it until one pint of tincture is obtained.

Tinctura Coto, B. P. C.—Take of: Coto bark, bruised, 2 ounces: rectified spirit, 1 pint. Macerate for seven days, with occasional agitation; then press, filter, and add sufficient rectified spirit to make one pint. "Coto bark" is defined to be "a bark of unknown origin obtained from Bolivia, in flat or curved pieces about 1 centimetre in thickness, and of variable length. The taste is aromatic and very biting. The transverse section is of a cinnamon brown color externally, and darker towards the inner surface.

Tinctura Ergotæ Ammoniata, B. P. C.—Take of: Ergot, in No. 20 powder, 10 ounces; aromatic spirit of ammonia, a sufficient quantity to make 1 pint. The directions for preparing this are the same as for "Tinctura Convallariæ" except that the preliminary maceration is 12 instead of 24 hours.

Tinctura Erythrophliæ, B. P. C.—Tincture of Casca.—Take of: Casca (*Erythrophlæum guineense*, G. Don.) bark, in No. 20 powder, 2 ounces; rectified spirit, a sufficient quantity to make 1 pint. The directions for preparing are the same as for "Tinctura Convallariæ."

Tinctura Eucalypti, B. P. C.—Take of Eucalyptus (*Eucalyptus globulus*, Labillardière) leaves, in No. 20 powder, 4 ounces; rectified spirit, a sufficient quantity to make 1 pint. The directions for preparing are the same as for "Tinctura convallariæ."

Tinctura Euphorbiæ Piluliferæ, B: P. C.—Take of Euphorbia in No. 20 powder, 4 ounces; proof spirit, a sufficient quantity to make 1 pint. The directions for preparing are the same as "the herb *Euphorbia pilulifera*, De Candolle, collected when in flower, and carefully dried. The involucral glands of the perianth are without appendages. The mature seeds are minutely wrinkled.

Tinctura Hamamelidis, B. P. C.—Take of Hamamelis (*Hamamelis Virginica*, Lin.) bark, in No. 20 powder, 2 ounces; proof spirit, a sufficient quantity to make 1 pint. The directions for preparing are the same as for "Tinctura Convallariæ."

Tinctura Hydrastis, B. P. C.—Take of Hydrastis (the rhizome of *Hydrastis canadensis*, Lin.), in No. 60 powder, 2 ounces; proof spirit, a sufficient quantity to make 1 pint. The directions for preparing are the same as for "Tinctura Convallariæ."

Tinctura Iodi Decolorata, B. P. C.—Take of iodine 250 grains; rectified spirit, 5½ fluid ounces. Dissolve by the aid of a gentle heat. When cold transfer to a stoppered bottle, and add of stronger solution of ammonia, 10 fluid drachms. Keep the mixture in a warm place until decolorized, after which dilute it with sufficient rectified spirit to produce 1 pint.

Tinctura Pruni Virginianæ, B. P. C.—Take of: Wild cherry bark (from *Prunus serotina*, Elliott, collected in autumn), in No. 20 powder, 4 ounces; distilled water, 7½ fluidounces. Macerate for twenty-four hours, in a closed vessel, and add: Rectified spirit, 12½ fluidounces. Macerate for seven days; then express, filter, and add sufficient proof spirit to make 1 pint.

Tinctura Quillaiæ, B. P. C.—Take of quillaia (*Quillaia Saponaria*, Molina) bark, in No. 20 powder, 2 ounces; rectified spirit, a sufficient quantity to make a pint. The directions for preparing this are the same as for "Tinctura Convallariæ."

Tinctura Strophanthi, B. P. C.—Take of: Strophanthus seeds, reduced to No. 30 powder, and dried at 110° F., 1 ounce. Pack in a percolator, and moisten with pure ether (sp. gr. 720). Macerate for twenty-four hours, then allow percolation to proceed, continuing the addition of ether until the fluid passes through colorless (about 8 or ten fluidounces suffice). Remove the marc from the percolator, and dry it, gradually heating it to 120° Fahr. Again reduce it to powder, repack in the percolator, and moisten with rectified spirit. Macerate for forty-eight hours, then pour on successive quantities of spirit, percolating slowly, until 1 pint of tincture is obtained.

"Strophanthus seeds" are defined to be, "The seeds, deprived of the apical hairy appendage, of a species of *Strophanthus* growing in Eastern Africa, and usually referred to *S. Kombe*, Oliver. The seeds are plano-convex, of a greyish-green or pale-brown color, 18 millimetres long and 4 millimetres broad in their greatest diameter, rounded at the base and tapering at the apex, covered with appressed silky hairs, which become much shorter at the apex of the seed, and furnished on the flat side with a longitudinal ridge, disappearing below the middle of the seed."—Yearbook of Pharmacy, 1887, 593–597.

Tincture of Strophanthus—Improved Formula and Process.—For reasons given in his paper on *Strophanthus* (which see under "Materia Medica"), Mr. W. Elborne recommends the following formula and process for making tincture of Strophanthus:

Take of strophanthus seed, 1 ounce; absolute alcohol, 18 fluidounces; distilled water, 3 fluidounces; rectified spirit, petroleum ether, of each a sufficient quantity. Reduce the seed to fine powder, dry at a temperature of 120° F., exhaust by percolation with petroleum ether until free from oil, dry the residue at 120° F. To the water add 3 fluid drachms of absolute alcohol, mix thoroughly with the dried residue, and allow to macerate six hours, now add the remaining alcohol, shake well together, and set aside for twenty-four hours with occasional agitation. Filter, and when the filtrate ceases to pass continue the filtration with rectified spirit until 20 fluid ounces have been obtained.—Yearbook of Pharm., 1887, 424.

Tincture of Opium—Commercial Quality.—Eight samples of tincture of opium, procured from reputable pharmacists, were examined by Mr. A. W. Sheup, the U. S. P. method of assay being followed. Tincture of opium should contain from 1.2 to 1.6 per cent. of morphine. The samples contained 1.23, 0.825, 0.78, 0.738, 0.73, 0.561, 0.52 and 0.492 per cent. of morphine respectively. The author made a sample of tincture from ordinary moist opium, finding that the preparation contained nearly all the morphine present in the drug. This tincture contained 0.9 per cent. of morphine, and, with a single exception, was consequently stronger than any of the preparations examined. It appears, therefore, quite probable that opium in its ordinary moist condition was substituted for the powder, and that the provisions of the Pharmacopœia were totally disregarded.—Pharm. Era, Sept. 1887, 323; from Proc. Indiana Pharm. Assoc., 1887.

Tinctura Opii Crocata—Cause of Precipitation.—According to Howakowski the continued formation of precipitate in tinctura opii crocata is due to the putrefactive decomposition of the protein and mucilaginous substances derived from the opium. Ammonia being formed during this change, some of the opium alkaloids together with the products of decomposition of the saffron glucoside are precipitated. To avoid this change the author recommends the extraction of the opium and saffron with moderately diluted alcohol, which secures the separation of the protein substance and mucilage. As a matter of fact, the older formulas directed stronger alcoholic fluids for this purpose, than are at present directed. Chem. Report., Dec. 11, 1887, 298; from Czasop. Touarz. Aptek., 1887.

Tincture of Ipecac and Opium—Modification of the Officinal Formula.—Mr. Wm. H. Clark observes that the tincture of ipecac and opium is liable to ferment, and this is due to its being weakened in alcoholic strength by the evaporation of one of its components. He found a tincture prepared in strict conformity with the U. S. Pharm. to contain but 17.75 per cent. of alcohol, and suggests that the use of strong alcohol instead of dilute alcohol, as now directed to restore the evaporated portion to the proper volume, will insure a permanent tincture. So made it contains 20 per cent. of absolute alcohol by weight. Amer. Jour. Pharm. May, 1888, 226.

Tincture of Ginger—Decolorization, etc.—Mr. Frank M. Siggins tried sodium and ammonium hydrates to ascertain whether they could be used to form a good extract soluble in water; but the results were not satisfactory. By percolating the tincture of the drug through animal charcoal, it may be made nearly colorless, and still retains the sharp, pungent and characteristic taste.—Amer. Jour. Phar., June, 1888, 278.

Tincture of Vanilla—Preparation.—Mr. John K. Faust, while retaining the pharmacopœial percentage of vanilla in this preparation, proposes changes in the menstruum and in the manipulation. Cut vanilla, 10 parts, is beaten into a uniform powder with washed sand, 75 parts, the mixture packed into a percolator, and macerated for four hours with sufficient menstruum composed of alcohol 50 parts, glycerin 19 parts and water 31 parts; percolation is then allowed to proceed until 100 parts of tincture have been obtained. Amer. Jour. Phar., Jan. 1888, 9.

Tincture of Quillaia—Proper Menstruum.—Mr. Peter Boa makes some practical remarks on the preparation of tincture of quillaia. He considers the formula of B. Ph. C. Formulary (see above), well adapted for the use to which it is applied, *i. e*, the preparation of "Liquor Picis Carbonis" (see under "Liquores"), but the tincture is in considerable demand as a medicinal agent; hence it is a proper inquiry to determine whether rectified spirit is the most suitable menstruum for the extraction of the quillaia bark. He finds that all the writers on the subject that have been consulted by him agree that water is the best solvent of saponin, which is regarded as the active principle of the bark. The preponderting evidence respecting the proper menstruum for a tincture appears to be in favor of a weak alcoholic menstruum, and this also is the conclusion that his own experiments lead him to, the use of alcohol at all being, in point of fact, necessary only as a preservative. As to the proper strength of the tincture, one made in the proportion of 2 ounces to a pint (1 : 10) is probably the most desirable, though the proportion of 1 : 20 would approximate its strength to that of tincture of senega.—Pharm. Jour. and Trans. Nov. 19, 1887, 426.

Tincture of Anthrarobin—Preparation.—Tinctures of anthrarobin (the new substitute for chrysarobin) are prepared of 10 and 20 per cent. strength by dissolving the substance in the requisite quantity of alcohol, viz., 10:90 and 20:80 respectively.—Amer. Drug., June 1888, 114; from Therap. Monatshefte.

Tinctura Moschi, U. S. P.—Questionable Utility.—Mr. P. E. Hommell observes that when physicians need the effect of musk, they usually exhibit it in form of pill, emulsion, suppository, and sometimes as an enemata. It is rarely administered as tincture, and he therefore thinks that it should be dropped from the Pharmacopœia, the more particularly since the tincture is not suitable for perfumery, perfumers using other formulas which give better results.—Proc. N. J. Pharm. Assoc., 1888, 109.

Tincture of Castor—An Alleged Cure for the Morphine Habit.—Mr. Cramer accidentally discovered in the tincture of castor (castor 1, alcohol 5), a remedy for breaking off the morphine habit.—Rundschau, 1887, 812; Pharm. Centralh., 1887, 645.

Tincture of Iodine—Rapid Preparation.—Mr. C. Dandt observes that iodine will dissolve rapidly in absolute alcohol. He recommends to use the proper quantity of absolute alcohol, and to add sufficient water to reduce the alcohol to the officinal strength. The U. S. tincture would then require the following modification: Iodine, 8 p.; absolute alcohol, 86 p.; water, 6 p.—Amer. Drugg., June 1888, 110; from Pharm. Ztg.

Tincture of Iodine—Intervention of Sand to Effect the Solution of the Iodine.—Mr. A. B. Stevens recommends to triturate the iodine with three times its weight of sand until reduced to uniform fineness, then to place a piece of absorbent cotton into a small cylindrical percolator, and to percolate, with the usual precautions, until the requisite quantity of tincture is obtained. The sand is thus completely and rapidly extracted.—Pharm. Era, Jan. 1888, 25.

Colorless Tincture of Iodine—New Formula.—The following formula is given in the "Medical Press": Iodide of ammonium, ʒij; iodoform, ʒss; ammonia water, ʒss; alcohol, ℥iijss. The mixture should be left exposed to the light eight or ten days, when all trace of color is gone.

Tinctura Saponis Viridis—Formula and Uses.—Dr. Unna recommends the following formula for tincture of green soap: Green soap, 100; strong alcohol, 50; and oil of lavender, 0.2 parts. This forms a convenient vehicle for the external application of chloroform, oil of turpentine, tar, benzol and ether, of which equal parts may be dissolved in the solution. At the temperature of the body the tincture will dissolve 40 per cent. of carbon bisulphide.—Amer. Jour. Pharm., Nov. 1887, 557.

TROCHISCI.

Santonin Lozenges—Determination of Santonin.—A correspondent of the "Jour. de Phar. d'Anvers" has made an examination of several samples of santonin lozenges, obtained principally from the lozenge manufacturers of Belgium. The process employed by him is as follows:

10 lozenges are reduced to a fine powder and digested with chloroform in a small flask for half an hour. The chloroform solution is then filtered, the residue upon the filter washed two or three times with chloroform, and the solutions evaporated with the aid of a gentle heat. The santonin remains in a pure crystalline state. According to the Codex, each lozenge should contain 25 milligrams of santonin, but the examination showed that not one of the samples contained more than 10 milligrams in each lozenge.—Pharm. Post, 1888, 27.

Chlorate of Potash Lozenges—Caution Regarding their Use.—The "Medical World" says that phenomena indicating changes in the blood have been noticed after the abuse of chlorate of potash lozenges, in the treatment of "sore throat." The lozenges usually contain five grains of the salt in each; and their constant sucking may easily result in the ingestion of an absolutely poisonous amount of chlorate of potash.—Drugg. Circ., April 1888, 83.

Tar Troches—Preparation without Sugar.—Mr. Mayet communicates the following formula for making tar troches without sugar: Norwegian tar, 2 gm.; sodium bicarb., 18 gm.; calcium phosphate, 18 gm.; oil of anise, 5 drops. Make 100 troches. Each contains 0.02 of tar.—Phar. Zeitung, p. 305.

Saccharin Pastilles—Formation and Use.—Dr. Fischer recommends pastilles of saccharin for sweetening the coffee, etc., of diabetic patients. They are composed as follows: Saccharin, 3.0; exsiccated sodium carbonate, 2.0; mannit, 50.0. Make 100 pastilles.—D. Med. Wochenschrift, Sept. 1887.

UNGUENTÆ.

Mercurial Ointment—Extinction of the Mercury by the aid of Metallic Potassium.—Mr. Jacquemaire proposes for the extinction of the mercury from mercurial ointment the addition of either potassium or sodium, preferring, however, potassium, neither of these metals affecting the final product unfavorably, whilst the extinction is perfected in 10 minutes. 100 parts of mercury are warmed to drive off traces of water, and 1 part of potassium is then added in small fragments. A slight crepitation shows that combination has taken place, and the mercury is stirred with a rod to diffuse the resulting amalgam equally. The metallic mixture is then added to the fat, and the whole beaten vigorously.—Pharm. Jour. and Trans., June 30, 1888, 1086; from Jour. Pharm. Chim., May 1888, 513.

Unguentum Hydrargyri—Amount of Mercuric Oxide, etc., in Commercial Samples.—Mr. M. C. Craine examined a number of specimens of mercurial ointment obtained from pharmacists and manufacturers, with a view of determining the amount of mercury oxides present. The ointment was digested with benzin to remove fat, and the residue treated with alcohol to dissolve resinous matters; the metallic residue was weighed, treated with dilute nitric acid and again weighed; the amount dissolved by the acid was noted as mercury oxide, no account being taken of the possible presence of other metals.

Ointments sold as containing 50 per cent. of mercury.			Ointments sold as containing 33⅓ per cent. of mercury.		
NO.	MERCURY FOUND.	OXIDE FOUND.	NO.	MERCURY FOUND.	OXIDE FOUND.
1	48 per cent.	1.125 per cent.	1	29.6 per cent.	.75 per cent.
2	37.375 per cent.	.75 per cent.	2	33.25 per cent.	.85 per cent.
3	49.125 per cent.	2. per cent.	3	33.75 per cent.	.675 per cent.
4	49. per cent.	.875 per cent.	4	31.75 per cent.	.6875 per cent.
5	33.75 per cent.	.5 per cent.	5	26.5 per cent.	.5 per cent.
6	29.4 per cent.	trace.	6	31. per cent.	.633 per cent.
7	42.5 per cent.	1.5 per cent.	7	32.125 per cent.	.84 per cent.
8	51.25 per cent.	1.6 per cent.	8	31. per cent.	.6 per cent.
Average	42.5 per cent.	1.044 per cent.	Average	31.122 per cent.	.692 per cent.

—Amer. Jour. Pharm., Jan. 1888, 10–11.

Ointment of Yellow Oxide of Mercury—Method of Securing Smooth Admixture.—Mr. A. B. Stevens observes that in order to obtain an ointment so smoothly mixed that the particles of yellow oxide cannot be seen, the latter may be rubbed (on a slab with a spatula) with a small quantity of alcohol, till a sufficient degree of smoothness is attained; then incorporate a small quantity of the base before the alcohol has entirely evaporated, and add the remainder of the base in small quantities. To prepare a perfectly smooth cream-like

Ointment of Oxide of Zinc by the U. S. P. method, it is necessary to have the mortar and pestle a little above the melting point of lard, this being best accomplished by immersing it in water, and heating gradually to the desired temperature. The mortar should then be wiped perfectly dry, and the oxide (previously? Rep.), rubbed to a fine powder, triturated with the melted benzoated lard in small quantities at a time: the trituration to be continued until the ointment is quite firm to prevent a partial separation.—Pharm. Era, April 1888, 137.

Unguentum Acidi Borici—Formula.—The following formula is given in "Can. Pract.:" Melt together 1 part yellow wax and 6 parts benzoated lard, and incorporate with this 1 part boric acid in impalpable powder.

Iodol Ointment—Formula.—Prof. Trousseau uses the following formula for iodol ointment: Iodol, petrolatum, of each equal parts. Mix.—Amer. Jour. Pharm., Dec. 1881, 613; from L'Union Méd.

Anthrarobin Ointment—Formula.—Mr. Behrend gives formulas for 10 and 20 per cent. anthrarobin ointments as substitutes for chrysarobin ointments. The base may be either olive oil and lanolin or olive oil and lard, the preparations having to be varied according to the strength of the ointment. For the 10 per cent. ointment, 30 parts olive oil and 60 parts of lanolin, or 15 parts olive oil and 75 parts of lard. For the 20 per cent. ointment, equal parts of olive oil and lanolin, or 20 parts of olive oil and 60 parts of lard.—Amer. Drugg., June 1888, 114; from Therap. Monatshefte.

Anti-neuralgic Salve—Formula.—The following formula is recommended by Galezowski for a salve to be applied to the painful part in cases of neuralgia: Menthol, 15 parts; cocaine (alkaloid), 5 parts; chloral, 3 parts; petrolatum, 100 parts. Mix intimately.—Amer. Drugg., June 1888, 114.

Chilblain Ointment—Russian Formula.—The following formula for a chilblain ointment is given in "Pharm. Centralh." (1888, 12): Beef marrow, 40 parts; hydrochloric acid, 30 parts; marshmallow ointment, 120 parts; extract of opium, 2.5 parts; camphor, 10 parts; and Venice turpentine, 25 parts.

VINÆ.

Bitter Wine of Iron—Analysis.—Mr. Herman J. M. Schroeter has subjected commercial samples of bitter wine to analysis, and gives the results in a table as follows, No. 1 being a preparation made in strict conformity with the U. S. Pharm.

	U.S.P., No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6,
Color.	greenish, yellow-brown.	very dark greenish-brown.	dark reddish-brown.	reddish-brown.	light reddish-brown.	reddish-brown.
Taste.	very bitter.	bitter.	medium bitter.	medium bitter.	bitter.	not bitter.
Sp. gr. at 20° C.	1.114	1.062	1.049	1.041	1.091	1.044
Per cent. of alcohol by weight.	20.5 p. c.	15.75 p. c.	14.27 p. c.	9.57 p. c.	13. p. c.	9.36 p. c.
Fixed residue.	13.25 p. c.	10.15 p. c.	10.30 p. c.	8.075 p. c.	11.20 p. c.	5.65 p. e.
Ash.	0.70 p. c.	1.80 p. c.	1.41 p. c.	1.475 p. c.	2.00 p. c.	1.40 p. c.
Fe_2O_3.	0.50 p. c.	0.42 p. c.	0.475 p. c.	0.35 p. c.	0.48 p. c.	0.225 p. c.
Alkaloid.	quinine, 0.48 p. c.	cinchonidine, 0.40 p. c.	cinchonidine, 0.225 p. c.	quinine, 0.125 p. c.	quinine, 0.45 p. c.	undetermined, 0.05 p. c.
Citric or Tartaric acid.	citric acid.	tartaric, trace of citric acid.	citric acid.	citric acid.	tartaric acid.	tartaric acid.

No method for assaying bitter wine of iron being given by the Pharmacopœia, the author recommends the following method of examination: Note physical properties, which should not be far from those indicated under No. 1 with a specific gravity of 1.110 to 1.120. Estimate alcohol by the method given by the Pharmacopœia for white wine—the amount by weight should not be far from 20 per cent. Determine dry extract by evaporation on a water-bath to constant weight, ignite this and determine percentage of ash; from which estimate the iron. Treat 20 gm. of the solution of bitter wine of iron with 0.100 gm. of tartaric acid, add sodium hydrate in slight excess, agitate with four successive portions of chloroform, mix these four chloroformic extractions, evaporate to constant weight, and weigh; the yield should be 0.48 per cent. Determine the identity of this alkaloidal residue. Finally apply tests for citric and tartaric acids; those for the former acid in a complex mixture can only be of a confirmatory character, but those for the latter one are more positive; for when the silver mirror is obtained, there is little room left for doubt.—Amer. Jour. Phar., Jan. 1888, 1–5.

Beef, Iron and Wine—Suggestions.—Mr. Fried. Grazer observes that the method usually adopted for the removal of the common salt from the "Liebig's" extract of beef, viz., treatment with alcohol, is properly and more efficiently replaced by dialysis. To prevent the coloration caused by the reaction of the tannin of the wine with the ferric citrate, the wine should be detannated, preferably by means of the gelatine contained in the extract of beef. For this purpose the lukewarm dialyzed solution of beef extract is added to the wine, allowed to stand several days, and filtered, after which the iron solution may be added. Instead of sweetening the preparation with syrup or glycerin, the author prefers to use the sweet California wine, known as Angelica.—Phar. Rundschau., Jan. 1888, 9–10.

MISCELLANEOUS FORMULAS.

Dried Food—A Complete Aliment.—Mr. Adrian proposes the following method of preparing a complete aliment, which is intended to replace the meat-powders in common use for weak and convalescent patients: Powdered roast beef, 200; powdered broiled bread (previously saturated with meat juice), 200; powdered vegetables, 200; sugar of milk, 150; tapioca, 150; dextrin, 50; malt, 50=1000. One part of the powder represents five parts of the substances when fresh. The preparation is made in a granulated form and is readily miscible with soups.—Amer. Jour. Phar., June 1888, 288; from J. de Ph. et de Chim., April 1, 1888.

Milk-Powder—Preparation.—The following process for making milk-powder is given in Amer. Drugg. (April 1888, 76); Skimmed milk is evaporated in a suitable apparatus, preferably in vacuo and under continued stirring, at a temperature of 60° to 70° C. (140°–158° F.) to a syrupy consisténce, then mixed with 30 to 50 per cent. of its weight of finely powdered sugar, and the heat continued at 30° to 55° C. (86°–131° F.), with constant stirring, until dry and granular.

Milk-Jelly—Preparation.—Milk-jelly is a variation in milk diet, recommended to be prepared by Professor Liebreich as follows: Heat one quart of milk with one pound of sugar, and when the sugar is dissolved continue the heat, at a boiling temperature, for about ten minutes. Now cool well, and then add, slowly stirring, a solution of one ounce of gelatin in a cupful of water. Next add the juice of 3 or 4 lemons in 3 wineglassful of wine, brandy, or other liquor. Set the glasses containing the mixture in a cold place, so that the contents may gelatinize. It is necessary to have the milk quite cold before the other ingredients are added, as it would otherwise curdle.—Amer. Drugg., April 1888, 76.

Nutrient Enemata—Preparation.—Dr. Ewald recommends nutrient enemata to be prepared by mixing three or four eggs with four or five ounces of a solution containing from 15 to 20 per cent. of glucose. Mucilage of gum or of starch may be added, and, if required, a few drops of tincture of opium. Such an enema should be given only after the bowels have been well emptied, for which purpose an injection of luke-warm water or solution of table salt may be used.

Another form of enema is made by beating together two or three eggs with a tablespoonful of cold water and a little starch, adding a teacupful of 20 per cent. solution of glucose, heating the mixture gently, so as not to coagulate the albumen, and stirring in a wineglassful of red wine. Peptones may likewise be used in addition to, or for replacing the eggs. An enema of eight or nine ounces is preferably given in two or three doses.—Amer. Jour. Pharm., Nov. 1887, 555; from "Therap. Monatshefte."

Antiseptic Sponges—Preparation and Preservation..—It is stated in the "Vereinsblatt Pfälzischer Aertzte," that in the antiseptic process sponges of medium porosity are most easily treated, those in which the pores are too fine being freed with difficulty from sand and shell-lime. They are well dried by heat, and are freed from coarse sand by being beaten with canes, being then placed upon a coarse hair-sieve, and washed until the water runs off absolutely clear and free from sediment. The sponges are then subjected to the action of solution of permanganate of potassium (1:1000) for about two hours, and enough crude muriatic acid is added to cause the violet color to entirely disappear. By repeated washing with water the sponges are purified still further, until the water used in washing no longer reddens litmus paper. They are then well dried and placed in a solution of sublimate (1:1000), in which they are left for twelve hours. By occasional washing with distilled water the solution of mercuric chloride is removed, and the sponges are then dried in a room free from dust—preferably in a drying press—until they cease to lose weight. For preserving the sponges, metal vessels or wide-necked glass receptacles closing tightly are indispensable.—Amer. Drugg., Nov. 1887, 216; from "Lancet."

Antiseptic Cigarettes—Different Forms.—Dr. H. Macnaughtan Jones has devised several forms of antiseptic cigarettes for fumigating the naso-pharynx. He produces four forms: No. 1, containing eucalyptus and iodoform disguised with vanillin; No. 2, eucalyptus with iodosalicylic acid; No. 3, coltsfoot with eucalyptus and iodoform disguised with vanillin; No. 4, tobacco, eucalyptus, and iodoform disguised with coffee. Each cigarette contains one grain of the active ingredient. Dr. Jones adds that the iodosalicylic acid has not the unpleasant odor of iodoform and other iodine compounds, while it is quite as effective on the lower forms of life. Under combustion iodine is evolved. All the cigarettes are said to be pleasant to smoke. Those made with tobacco, eucalyptus, iodoform and coffee, are particularly agreeable, and the odor is thoroughly disguised; so indeed is it with those made with vanillin, the vapor being rather pleasant than otherwise.—Drugg. Circ., Nov. 1887, 249.

Iodine Pastilles—Formula for Disinfection.—Iodine pastilles for disinfecting the sick room, are prepared by incorporating iodine and salicylic acid with paraffin or wax, or similar material. In burning the pastilles the salicylic acid is converted into phenol, and this is volatilized with the iodine.—Rundschau, 1888, 50.

Iodoform Tampons—Preparation by Impregnating Wicking.—Mr. Gersune has found wicking impregnated with iodoform, an excellent material for tampons in the drainage of wounds whose secretion is moderate; in Billroth's clinic wicking saturated with tannin and iodoform is used with excellent results. Its removal is much less painful and inconvenient than that of gauze.—Centralblatt für Chirurgie; Med. News, Sept. 24, 1887.

Fumigating Wax—Formula.—Mr. Kratzer recommends the following formula as yielding a very fragrant fumigating wax: Styrax, 35 gm.; shellac, 50 gm.; benzoin, 195 gm.; linden charcoal, 58 gm.; balsam of Peru, oil of bergamot, of each, 18 drops; oil of rose, 10 drops. Melt the ingredients together, roll out the mass, and form into sticks.—Rundschau (Prag) 1887, 1000.

Disinfectants and Antiseptics—Preparation, etc.—Mr. A. S. Mitchell, on the basis of the recommendation of the report of the Committee on Disinfectants of the American Public Health Association, proposes the following disinfectant solutions to be kept in stock for convenience:

Chlorinated Lime.—The standard solution recommended in the above-mentioned report as No. 1, is made by dissolving 4 ounces of chlorinated lime in 1 gallon of pure water. The author recommends that it be kept on hand of double strength, the officinal chlorinated lime, containing 25 per cent. of available chlorine, being taken as the basis of calculation.

Corrosive Sublimate.—The standard solution No. 2 is made by dissolving 2 drachms each of corrosive sublimate and permanganate of potassium in 1 gallon of water. No. 3 is made by dissolving 4 ounces of corrosive sublimate and 1 pound of sulphate of copper in 1 gallon of water. Both of these are effectual disinfectants, but the last named should be dispensed in the dilute form recommended by the committee, viz., 2 fluidounces to a gallon of water, the standard solution being too strong to be trusted in the hands of the public.

Carbolic Acid is recommended in 5 per cent. solution. In the dilution some samples of apparently pure acid are prone to deposit a brown sediment. The author advises that it be kept on hand in 50 per cent. solution, ten parts of which are mixed in 90 parts of water, as required.

Sulphate of Copper may be kept in stock in 5 per cent. solution.

Chloride of Zinc is recommended in a 10 per cent. solution. When made from the dry fused article of commerce it is too expensive. It may be made cheaply by mixing the U. S. P. liquor zinci chloridi with 4 times its weight of water.

Sulphur.—A mixture of two pounds of broken-up roll sulphur, and one pound of flowers of sulphur, saturated with alcohol, ignites readily, and suffices to disinfect 1,000 cubic feet of air.—West. Drugg., Nov. 1887, 371–372; from Proc. Mich. Pharm. Assoc., 1887.

Antiseptic Solution—Remy's Formula.—The following is Remy's formula for an antiseptic solution: 5 cgm. of red iodide of mercury; dissolve in 30 grams of alcohol, and add 1,000 grams of water.—Pharm. Post, 1887, 777.

Antiseptic Solution—Non-Irritating Preparation.—Prof. R. Lepine uses the following liquid for washing wounds, the powerful antiseptic action being due to a number of compounds, of which each is present only in very small quantity: Corrosive sublimate, 1 milligm.; phenol, 0.10; salicylic acid, 0.10; benzoic acid, 0.05; chlorinated lime, 0.05; bromine, 0.01; acid bromhydrate of quinine, 0.20; and water, 100 gm.—Amer. Jour. Pharm., Nov. 1887, 556.

Listerine—Composition.—The antiseptic solution used in England and America under this name, according to "Fortschritt," has the following composition:

Acid benzoic	8.0 gm.
Borax	8.0 gm.
Acid boric	16.0 gm.
Thymol	2.4 gm.
Eucalyptol	10 drops.
Oil gaultheria	10 drops.
Oil menth. pip	6 drops.
Oil thyme	2 drops.
Spt. vin. rect.	180.0 gm.
Aqua sufficient for	1000.0 gm.

Antiseptic Powders—Formulas.—Lucas-Championière uses for wounds an intimate mixture of equal parts of iodoform, cinchona, benzoin and carbonate of magnesia, all finely powdered and sifted, then adds some oil of eucalyptus to the mixture.

Barbocci recommends a powder, composed of equal parts of animal charcoal and camphor, for disinfecting and deodorizing old excavated ulcers.—Amer. Jour. Pharm., Nov. 1887, 556.

Corrosive Sublimate Paper—Preparation and Uses.—Corrosive sublimate paper is prepared by saturating filtering paper with a solution containing 2 per cent. of mercuric chloride and 5 per cent. of glycerin, and drying. This paper is used in layers of two to eight as an antiseptic dressing for wounds.—Amer. Jour. Pharm., Nov. 1887, 556.

General Poison Antidote—Formula and Utility.—A general antidote for poisons is a mixture composed of equal parts of calcined magnesia, wood charcoal, and hydrated oxide of iron, with a sufficient quantity of water. It is, as a harmless and simple remedy, applicable in such cases when the nature of the poison is unknown.—Rundschau, 1888, 15.

Menthol Snuff—Formula.—Dr. Beehag gives the following formula for "Menthol Snuff": Menthol, 30; chloride of ammonium, 90; boric acid, 60. Triturate to a fine powder. Chloride of sodium might be substituted for the ammonium salt.—Am. Drugg., April 1888, 75.

Menthol Pencils—Preparation.—Dr. G. Vulpius recommends the following method for preparing menthol pencils intended for the antiseptic treatment of wounds: Cacao butter is melted on a water-bath with 3 to 4 per cent. of pure wax, and the menthol is added to the somewhat cooled mass in the proportion prescribed by the physician—this amounting usually to 3 or 4 per cent. By suction it is collected in glass tubes of the required bore—from the thickness of a knitting needle to that of a lead pencil—which have previously been moistened with glycerin, and the tubes are then placed in cold water. After a short time the menthol pencils are removed from the tubes by means of wires, glass rods, etc., of suitable size.—Arch. de Pharm., May 1888, 419; from Südd. Apoth. Ztg., 1888. 57.

Pencils of Ammonium Carbonate, with Camphor and Menthol—Use in the Treatment of Fly-bites.—Mr. Mylius has found that flies have a most acute sense of smell, and that the irritation of their bites is caused by an acid lodged in the wound by the sting. After a long series of experiments with ointments and perfumes, he failed to find a satisfactory agent for preventing fly-bites, which could be conveniently used with children. As a means of treatment Mylius has prepared pencils of ammonium carbonate, camphor, and menthol, which can be instantly applied after a bite. Occasional cases were observed in which the sting had entered the lymphatics, producing more severe infection. Such cases may be treated by cold compresses saturated with equal parts of dilute carbolic acid solution and lead water, to which is added 10 per cent. spirit of camphor.—Deutsche medicinische Wochenschrift; Med. News, Sept. 3, 1887; Am. Jour. Phar., Dec. 1887, 607.

Caustic Paste—Improved Formula.—Dr. Jules Felix recommends the following formula for caustic paste: Powdered starch, 37 parts; wheat flour, 112 parts; bichloride of mercury, 1 part; chloride of zinc, 110 parts; iodol, 10 parts; croton chloral, 10 parts; bromide of camphor, 10 parts; crystallized carbolic acid, 10 parts. The separately powdered ingredients are made into a paste with water in a glass mortar. The preparation produces a hard and well limited eschar with little pain, its action being perfectly under control, being limited to the duration of the application.—Pharm. Era, Nov. 1887, 411.

Tooth Preparations.—Dr. Frederick Hoffmann communicates some interesting information respecting the proper preparation of tooth powders, tooth pastes, and tooth tinctures, which may be consulted in Pharm. Rundschau, Dec. 1887, 279–281.

Tooth Wash—Formula.—Mr. Guincerot recommends the following mixture as a remedy for loose teeth: Tannin, 8 parts; potassium iodide, 1 part; tincture of iodine and tincture of myrrh, each, 5 parts; rose water, 200 parts. Teaspoonful in lukewarm water, as a wash for rinsing the gums in the morning.—Pharm. Centralhalle, 1887, 398.

Salol Mouth Wash—Formula and Uses.—Dr. Seifert recommends a solution of six parts of salol in one hundred parts of alcohol; a spoonful of this liquid mixed with a glass of warm water is used as a mouth-wash or gargle in stomatitis and other affections.—Amer. Jour. Pharm., Sept. 1887, 441; from Centralb. f. Klin. Med., 1887.

Hair Tonic—Preparation.—Dr. Foley, in discussing the tonic treatment of the hair, states that the end we seek in building up a scanty hair crop is a proper amount of blood supply, through friction and hair tonics. The appended is an excellent hair tonic:

℞.	Acid. carbolic	ʒ ss.
	Tinct. nucis vom	ʒ ij.
	Tinct. cinchonæ rubræ.	℥ j.
	Tinct. cantharidis.	ʒ ss.
	Aq. coloniensis.	
	Ol. cocois	āā q. s. ad ℥ iv. M.

Apply once or twice a day to the scalp by means of a soft sponge. This will prevent the hair from falling out, if it does not produce a luxuriant crop.

—Amer. Jour. Pharm., Sept. 1887, 441; from N. Y. Med. Jour.

Pasta Mack—A New Toilet Preparation.—Under the name of "Pasta Mack" a new toilet preparation has been introduced, which dissolves in water with evolution of carbonic acid, and is said to produce an agreeable and refreshing effect upon the skin. According to Mr. Eckstein it is composed of a mixture of 27 parts rice starch and 73 parts effervescing powder (bicarbonate of sodium 10, tartaric acid 9), suitably perfumed and formed into small tablets. The perfume imparted to the water is strong and agreeable, and remains upon the skin long after washing.—Rundschau (Prag) 1888, 12.

Black Leather Varnish—Formula.—Dissolve 150 parts of shellac in 800 parts of alcohol, and add the solution to a melted mixture of 15 parts of Venice turpentine and 15 parts of yellow wax. Then add 40 parts of *nigrosin* (alcohol-soluble), and lastly enough alcohol to make 1,000 parts of varnish. The nigrosin may be substituted by 50 parts of lamp-black, which should be first triturated with a small quantity of the alcoholic solution so as to produce a perfect mixture. The leather which is to be varnished should first be cleaned with a warm solution of green soap in water, or with a mixture of 3 parts of alcohol and 1 part of water of ammonia, then allowed to dry completely before applying the varnish with a soft brush. It is finally rubbed over with a dry brush.—Amer. Drugg., June 1888, 108.

Color-Changing Varnish—Preparation.—According to "Pharm. Ztg." (1888, 319), a color-changing varnish, patented in Europe, consists of a solution of platino-magnesium cyanide, to which gelatin, gum, or similar fixing material, has been added. The articles coated or impregnated with this solution, after drying by a moderate heat, retain their original color until exposed to moist atmosphere, when a rose or red color, modified by the natural color of the article, makes its appearance, and remains permanent, until exposed to heat.

Mucilage Substitute—Formula.—A good mixture for adhesive labels is said to be made according to the following formula: Dissolve 14 ounces of sugar in 2 pints of water, heat the solution to boiling, and add 3½ ounces of calcium hydrate; stir assiduously and allow the mixture to settle during several days. Draw off the viscous supernatant liquid, and mix it with a hot glue solution, in the proportion of 3 parts of the former to 1 part of the latter. The excellent mucilage resulting may be kept good for years by the addition of a small quantity of salicylic acid.—Amer. Drugg., Nov. 1887, 216.

Flexible Mucilage—Formula.—A mucilage that keeps well and is thoroughly elastic is made as follows: To 20 parts of alcohol add 1 part of salicylic acid, 3 parts of soft soap, and 3 parts of glycerin. Shake well, and then add a mucilage made of 93 parts of gum arabic and 180 parts of water.—Amer. Drugg., Feb. 1888, 25.

Liquid Glue—Good Formula.—Liquid glue, possessing great resisting power, and particularly recommended for wood and iron, is prepared according to Hesz as follows: Clear gelatin, 100 parts; cabinet-maker's glue, 100 parts; alcohol, 25 parts, and alum, 2 parts; the whole mixed with a 20 per cent. acetic acid, and heated on a water-bath for six hours. An ordinary liquid glue, also well adapted for wood and iron, is made by boiling together for several hours 100 parts glue, 260 parts water, and 16 parts of nitric acid.—Rundschau (Prag), 1888, 74.

Chrome Glue—Proportions, etc.—According to "Revue Scientifique" the proper proportion of bichromate to render glue insoluble is 1 part to 50 of the glue mixture; the bichromate to be added just before using.—Amer. Jour. Pharm., June 1888, 289.

Rubber Cement.—A useful cement for experimental purposes is said to be obtained by melting together equal parts of gutta percha and white pine pitch. It improves by remelting, and softens at about the temperature of boiling water.—Pharm. Era, May 1888, 181.

Bottle Cement—Formula.—A good bottle cement, which must be applied to stoppers while fresh, is obtained by mixing together 3 parts powdered rosin, 1 part caustic soda, and 5 parts water; then incorporating, just before using, 4½ parts plaster of Paris. The mixture hardens in about three-quarters of an hour, is very adhesive and not porous.—Amer. Drugg., March 1888, 50.

Aquarium Cement—Formula.—Litharge, fine white sand, gypsum, each one kilo; finely powdered rosin, 350 gm. Carefully knead into a paste with linseed oil, varnish, and a small quantity of dryer. It is fit for use in a few hours, and answers equally well for salt or fresh water tanks.—Ph. Centralhalle, 1887, No. 22

Lipanin—A Substitute for Cod Liver Oil.—According to "Phar. Ztg" (1888, 102), lipanin, which has been recommended as a substitute for cod liver oil, is prepared by partial saponification of pure olive oil, and separating the excess of oil together with the liberated oleic acid. It is an oily liquid, closely resembling olive oil, contains 5 to 6 per cent. of free fat acids (oleic), and readily forms a milk-white emulsion, when agitated with an equal bulk of water containing a little soda. The amount of free acid is readily determined by dissolving 2 gm. lipanin in 20 c.c. ether, adding 10 c.c. alcohol and a few drops of phenolphthalein, and titrating with normal alkali.

Erasive Compounds—Various Formulas.—The following formulas are given in "Neu. Erfahr. u. Erfind." for compounds to remove grease spots, etc., from cotton or silk fabrics:

1. Common soap, 1 lb.; ox gall, ½ lb.; Venice turpentine, 1 oz.

2. Shavings of soap, 1½ lbs.; ox gall, 1½ lbs.; honey, 1 oz.; sugar, 1½ oz.; turpentine, ¼ oz.

3. White soap, 15 oz.; pure potash, 3 oz.; oil of turpentine, 2 oz.

The last compound (3) is used to remove pitch, wax, paint, etc.—Pharm. Era, Jan. 1888, 26.

Flash Powder for Instantaneous Photography—Formula.—A flash-powder used in photography for taking instantaneous pictures, is made by mixing together coarsely crushed sugar, 1 part; magnesium, in powder, 1 part; chlorate of potassium, 2 parts. This powder, according to Harvey, is one of the best for this purpose, but care must be taken that the sugar is not in fine powder, as otherwise the explosions will be too violent. In another formula Borlinette recommends equal parts picric acid and chlorate of potassium. This is cheaper than the first, but it is more dangerous and must be used with care.—Rundschau (Prag), 1888, 91.

Hand-Grenades—Ready Preparation.—A writer in "Chambers' Journal" proposes the following method of making hand-grenades cheaply and equally efficient to the high-priced article recommended and sold for extinguishing incipient fires. The solution recommended is a mixture of 19.47 parts common salt, 8.88 parts sal ammoniac, and 71.66 parts water. It is entirely unnecessary to compound the mixture with any such exactness, as a rough approximation to the proportions given will give practically the same results. Having prepared this solution, the next thing is, to provide suitable receptacles for it, and place them about the house. The glass flasks used by chemists make excellent hand-grenades, for they are of thin glass, and hold just about the right amount of fluid. The principal objection to them is their cost, but the combined cost of such flasks and the solution for filling them is much below the current price of hand-grenades. There are certain kinds of wine-bottles also which might be used advantageously, as the only necessary feature is thinness of glass, so that the grenade will surely break when thrown at a fire. The bottle or flask should, of course, be stoppered; and it were well to cover the corks with sealing-wax, so as to prevent any loss by evaporation.—Amer. Jour. Pharm., Sept. 1887, 474.

Fly and Mosquito Bane—Formula.—Messrs. Dieterich and Vomacka recommend the following formula as producing a good preparation to prevent the bite of flies, gnats and mosquitos: Dissolve 10 parts of expressed oil of bay (oleum lauri expressum) in 20 parts of ether, add a solution of 20 parts of oil of eucalyptus in 70 parts of alcohol, and filter the mixture rapidly in a covered funnel. The compound may be used on domestic animals as well as by man, or it may be applied to places about the house which it is desired to protect against the visitation of flies, etc.—Amer. Drugg., June 1888, 114.

MATERIA MEDICA.

A. Vegetable Drugs.

GENERAL SUBJECTS.

South American Drugs.—Dr. H. H. Rusby in an interesting narrative, describes the "Homes of our South American Drugs," as observed by him during a journey of over one year (1885 and 1886) through different South American Provinces. The journey was undertaken with the purpose of obtaining more definite information concerning the varieties, qualities and localities of our standard drugs, with special reference to coca, cinchona and chekan; of the seasons and methods of collecting and preparing them, and the establishment of commercial relations for securing, by cable, prompt and reliable supplies. Also, the investigation of the domestic remedies of the regions traversed. His journey was first to the Andean region of the West Coast, thence overland through the Amazonian region to Para. To give some idea of the diligence and thoroughness of Dr. Rusby's labors, it may be mentioned that during this journey he collected and forwarded to New York some five thousand specimens of organisms.—Proc. N. Y. State Pharm. Assoc., 1888, 158–170.

American Indigenous Plants.—Dr. R. G. Eccles has written a highly interesting paper on "American Indigenous Plants," which appears in "Western Druggist" (Feb. and March 1888, 43–46 and 79–81). The text of the paper is in the author's usual vigorous style, and will be read with pleasure by those interested in the subject. It is accompanied by tables giving the common name, botanic name, order, genus and species, by whom named, and the habitat of the officinal indigenous drugs.

Uncultivated Pharmacopœial Plants to be Found in the State of New York.—Dr. Alfred H. Huested contributes a paper on the uncultivated pharmacopœial plants found in the State of New York, a list of which is given, his source of information being Torrey's "Natural History of New York," Prof. Charles H. Peck, the State botanist, and, to a small extent, his personal observation. The names of the plants are arranged in alphabetical order, the botanical name first, then the pharmacopœial name, or that of the derivative synonym, and as much regard to abundance and location as has been secured. The list embraces seventy-four species.—Proc. N. Y. St. Phar. Assoc., 1888, 170–175.

Plants Naturalized in Victoria, Australia.—Mr. F. Reader has communicated a list of the plants which have become naturalized in Victoria, many of which may be met with around Melbourne. This list may be referred to in the Australian Journal of Pharmacy, June and Sept. 1887, 207–209 and 319–322.

Plants.—Source of *Nitrogen*, which see under "Inorganic Chemistry."

Herbarium Plants—Preservation.—Mr. S. Schönland gives an excellent method of preserving the colors of flowers, which has been successfully practiced in Berlin for several years without having become known to any extent abroad. It consists in a process of deoxidation by means of sulphurous acid. Three parts of a saturated solution of sulphurous acid in water are mixed with one part of methylated spirit, and the plants are immersed in this liquid; thick-leaved ones from 12 to 18 hours; delicate flowers only from 5 minutes to half an hour. After removal they are dried by exposure to the sun or to artificial heat and are then at once placed between sheets of drying paper in the usual way. If enough sheets are used it is rarely necessary to change the paper. The treatment not alone preserves the color, but hastens the drying, so that sempervivums can be dried in two days and orchids and arums in one day. The only difficulty attending the process is that of laying out delicate blossoms after treatment with the solution.—Pharm. Jour. and Trans., Dec. 31, 1887, 540; from Annals of Botany, Nov. 1887, 178.

Flowers—Preservation for Herbarium Specimens.—Mr. R. Hegler advises a method of preserving the natural colors of flowers, which consists in dusting salicylic acid on the plants as they lie in the press, and removing it again with a brush when they are dry. Red colors are particularly well preserved in this way. The salicylic acid may also be applied in form of solution (1:14) in alcohol by means of blotting paper or cotton soaked in it and placed above and below the flowers.—Pharm. Jour. and Trans., Jan. 28, 1888, 625; from D. Botan. Monatsh.

Old Remedies.—Professor J. M. Maisch describes the properties and uses of some old remedies which in the course of time have become obsolete, but some of which seem to deserve closer study on the part of pharmacists and physicians. The titles of these old drugs may find place here for convenient reference.

Potentilla canadensis, Linné.
Capsella bursa-pastoris, Moench.
Reseda luteola, Linné.
Ribes nigrum, Linné.
Cytisus Laburnum, Linné.
Humiria floribunda, Martin.
Acalypha indica, Linné.
Acalypha betulina, Retzius.
Syzygium Jambolanum, De Cand.
Schinus Molle, Linné.
Hydrocotyle asiatica, Linné.
Gymnema sylvestre, R. Brown.
Embelia Ribes, Burmann.
Siegesbeckia orientalis, Linné.
—Proc. Penn. Pharm. Assoc., 1888, 12–17.

List of Popular German Names for Medicaments.—Dr. Frederick Hoffmann, in the January number of the "Pharmaceutische Rundschau." has commenced the publication of an alphabetical list of the German names for medicaments in popular use, with their explanation. The list will be of high value to American pharmacists, since many of the names, while obsolete, having been carried down for generations, are yet now and then employed by certain classes of Germans, by whom, in fact, the particular drug indicated is not known by another name. The June number brings the list to the letter T; the conclusion is promised in the July number.

FUNGI.

Ergot—Active Principles.—Drs. Langgaard and Kobert have thoroughly studied ergot of rye and its active principles, and form the following conclusions: Ergotic acid is a narcotic poison, but exerts no influence on the uterus. Sphacelic acid acts very energetically on the uterus. Cornutin is an active poison and acts likewise energetically on the uterus. They found further that Dragendorff's and Podwyssotzki's sclerotic acid is only a very impure ergotic acid; that all ergotins of commerce are variable mixtures of the active principles, containing principally ergotic acid; that Wenzell's ecbolin is a very impure cornutin, and that Tanret's ergotinin is not poisonous nor does it possess any action on the uterus. A mixture of sphacelic acid and cornutin would be an excellent representative of the activity of ergot, but it loses its power after a short time. Fresh ergot of rye is still more reliable than its preparations.—Drugg. Circ., April 1888, 81; from Pharm. Ztg.

Morchella Esculenta—Isolation of Poisonous Principle.—The presence of a poisonous principle in the morel (*Morchella esculenta*) has been demonstrated by Messrs. Boström and Ponfich. Messrs. Boehm and Kuhn have now succeeded in isolating this substance, which they have named:

Helvellic Acid.—The process is briefly described as follows: Take 5 kilograms of the morchella and treat with 10 kilograms of absolute alcohol; evaporate the alcohol and treat with absolute ether. Evaporate a second time and digest with absolute alcohol; decant, evaporate and treat with water. This liquid, evaporated *in vacuo* over sulphuric acid, gives an acid syrup which represents the pure toxic substance. The salt of barium ($C_{12}H_{18}BaO_7$), appears in the form of white flakes insoluble in absolute alcohol. The authors have not found a characteristic chemical reaction for the new substance.—Jour. de Phar. et de Chim., Jan. 15, 1888; Amer. Jour. Pharm., March 1888, 139.

LICHENES.

Lichens—Compound Nature.—The following lucid account of Schwendener's theory of the nature of lichens is given by Mr. F. Boner: "These growths (lichens) are not simple plants, not individuals in the usual sense of the term. They are rather colonies which consist of hundreds of thousands of individuals, of which, however, only one acts as master, while the others in perpetual captivity provide nourishment for themselves and their master. The master is a fungus of the order *asconomycetes*, a parasite which is accustomed to live upon the work of others; its slaves are green algals which it has sought out, and indeed caught hold of and forced into service. It surrounds them as a spider does its prey, with a fibrous net of narrow meshes, which is gradually converted into an impenetrable covering. While, however, the spider sucks its prey and leaves it lying dead, the fungus invites the algæ taken into its web to more rapid activity, nay, more vigorous increase.''—Pharm. Era, Jan. 1888, 24; from Proceedings Micros. Soc., Manchester.

Cetraria Islandica—Constituents.—Messrs. Hönig and St. Schubert found that a hot water extract of *Cetraria islandica* contains two carbohydrates. One of these, which constitutes the bulk of the extract, and for which the author proposes to retain the name

Lichenin, is a gelatinous body, difficultly soluble in cold water, not colored blue by iodine, devoid of rotatory power, and soluble in hot water to an opalescent liquid. It is easily converted by boiling dilute acids into optically inactive dextrin and into crystallizable grape sugar. The other carbohydrate the authors propose to designate as

Lichenin Starch, since it appears to possess all the properties and behavior of soluble modifications of starch.—Pharm. Jour. and Trans., Oct. 29, 1887, 361; from Monatshefte, viii., 452.

Irish Moss—Value as an Emulsifier.—Mr. Albert Brown has also experimented with Irish moss, following the footsteps of Mr. Emlen Painter and Mr. E. Standt (see Emulsions), and has proven to his satisfaction that Irish moss gelatin is equally as good an emulsifier as gum arabic, and much cheaper.—Proc. Ala. Pharm. Assoc., 1888, 17–19.

FILICES.

Aspidium Marginale, Willd.—*Analysis of the Rhizomes.*.—Mr. Charles DeWalt Keefer has subjected the rhizomes of *Aspidium marginale*, Willdenen, collected in September along a hillside, facing northward, of South Mountain, Franklin county, Pa., to examination. The loss of the fresh rhizomes on drying at about 31° C. was 64.824 per cent. (60.454 per cent. in an experiment two years before). Petroleum spirit dissolved 4.40 per cent., composed of 0.40 volatile oil, 1.0 wax, and 3.0 saponifiable fat. Alcohol dissolved 3 per cent. of extract containing tannin, sugar, phlobaphene, and a bitter principle. Water dissolved mucilage, dextrin, glucose; dilute soda dissolved pectin and albuminoids; calcium oxalate, pararabin, hydrocellulose and starch were also present. The author was unable to determine the presence of filicic acid.—Amer. Jour. Pharm., May 1888, 229–230.

GRAMINACEÆ.

Oat Flour—Value in the Treatment of Burns.—Dr. Green recommends oat flour in the treatment of burns, on the ground of its freedom from odor, its soothing and antiseptic properties, its superior healing power, its cheapness, and the ease with which it can generally be obtained at short notice. He directs a paste to be made of equal parts of the flour and fresh (unsalted) lard, to be applied spread on lint or old calico, the application to be renewed every day or every second day, according to the exigencies of the case.—Drugg. Circ., Dec. 1887, 273; from Brit. Med. Jour.

Malt—Properties of Different Kinds.—Messrs. J. Morawski and M. Glaeser have studied the properties of different kinds of malt with the following results: 1. *Rye malt* has a much greater saccharating power than oat malt. 2. *Wheat malt* is of the same, if not of greater, value as rye malt. 3. The saccharating power of rye and wheat malt is but little inferior to that of *barley malt*, and in several instances was found to be of the same value. 4. *Oat malt* is inferior in saccharating power to malt from the other grains. 5. *Maize malt*, made at the ordinary temperature, is inferior to oat malt; if prepared at 30°C., and until the germ has twice or thrice the length of the corn, the saccharifying power is materially enhanced, and becomes equal to that of oat malt.—Chem. Repert., March 4, 1888, 58.

PALMACEÆ.

Palms—Useful Brazilian Species.—Dr. Theodore Peckolt, in continuation of his series of papers on the useful plants of Brazil, describes a number of palms and their uses. The following brief abstracts are of interest:

Raphia vinifera, Beauv., var. *tædigera*, Mart. A magnificent palm flourishing in the moist lowlands of equatorial Brazil. The stem and leaves find useful technical application. The fruit has been subjected to proximate examination. Its medium sized fruit was 42 cm. long by 39 cm. diameter, and weighed 47950 gm., of which the shell weighed 22100, the pulp 5600, and the seed 20250 gm. The proximate constituents of these several parts are the following:

The shell: Yellow solid fat, 0.316; wax and soft resin, 0.317; brown hard resin, 0.950; extractive, 0.814; moisture, 46.606 per cent.

The sarcocarp, which has a granular consistence, a handsome purple-red color, faint fruity odor, and a styptic, faintly bitter taste, contains 36.608 per cent. of dry substance, composed as follows: Light green fat, 0.446; dark-red resinous coloring matter, 1.428; gallic acid, 0.057; sugar, 2.153; extractive, 5.3 per cent.

The seed, which is white, ovoid, and very tough, has a styptic taste and is odorless, has the following composition: Water, 81.7; dry substance, 18.3 per cent., of which 0.144 is greenish fat, 4.003 blood-red resinous coloring matter, and 1.491 per cent. of raphia-tannic acid, producing with ferric chloride a greyish-black gelatinous mass.

Notwithstanding the bitter, styptic taste of the pulp, it is eaten by the Indians both in the raw state and boiled. A fixed oil is prepared from the pulp by boiling with water. This is known as

Oleo de Subati. It has a red-yellow color and bitter taste, and is used with food as well as medicinally; internally as a tonic; externally as an embrocation for sprains, etc.

Mauritia flexuosa, L. fil. One of the handsomest palms of the Brazilian forest, abounding in the provinces of Para and Amazonas. The uses of the different parts of this palm are very extensive. The young leaves are used as vegetable, the pith, which contains an abundance of starch, is used for making bread; the meal of the seeds for soup; the fruit pulp as a delicious dessert; the juice which issues from the trunk on incision, for making wine; while the leaves, petioles, and the trunk find a variety of useful applications. In the dead trunks of this palm a variety of insects accumulate, the larva of one of which—*calandra palmarum*—constitute a popular food when roasted in hot ashes.

Mauritia vinifera, Mart. The juice which flows from the trunk of this palm on making incisions is said to be even richer in sugar than that obtained from *M. flexuosa.* It furnishes by fermentation a light champagne-like wine, which is a popular beverage. By evaporating the fresh juice an extremely pleasantly flavored sugar is obtained. The leaf-buds furnish an excellent vegetable. The sarcocarp (fruit pulp) is used as food by the poorer classes, being mixed with mandioca-meal, formed into cakes, and dried in the sun or in ashes. Preserved with sugar it furnishes a popular confection. By boiling the fruit pulp with water a fixed oil is obtained, which is used with food. It has a blood-red color, is transparent, has a faint fruity odor, and pleasant mild taste. Sp. gr. 0.890. The seeds, which yield a bland, colorless fixed oil, are used as food.

Mauritia armata, Mart.
Mauritia aculeata, Humb. Bonp. and Kth.
Mauritia Martiana, Spruce.
Mauritia pumila, Wall.
Orophoma Carana, Spruce.
Orophoma subinermis, Spruce.
Lepidocareyum tenue, Mart.

The botanical and pharmacognostic description of these palms conclude the present portion of the author's paper (to June 1888). The uses to which their several parts are applied are of very limited pharmaceutical interest.—Pharm. Rundschau, June 1888, 129–134.

Phytelephas Macrocarpa, R. et P.—*Chemical Examination of the Seeds.*—The seeds of this plant, known as

Vegetable Ivory, and *Corojo*, have been subjected to chemical examination by Méhu. He found them to contain sugar, albumin, fat, and extractive. The fat or oil of corojo is an article of commerce, and supplies an excellent material for making soap and glycerin. The ash of the pericarp contains about 96 per cent. of silica, and is used as an excellent polishing material.—Pharm. Post, March 18, 1888, 181–182; from Jour. de Phar. et de Chim., xvi., 5.

MELANTHACEÆ.

Colchicum Seed—Assay.—Mr. A. Kremel determines the amount of colchicine in the seeds as follows: 20 grams of the unbruised seeds are exhausted in a displacement apparatus with boiling alcohol. After boiling for two hours the alcoholic tincture is poured into an evaporating dish, with the alcohol used in washing the receiver, and 25 c.cm. of water. The residuum, after evaporation to 10–15 c.cm., is filtered and exhausted with chloroform, which takes up the colchicine. The residue of evaporation from the chloroformic solution is again dissolved in chloroform, again evaporated, the chloroformic extract is treated with water to disassociate the compound of colchicine and chloroform ($C_{22}H_{25}NO_6 + 2CHCl_3$) which has formed, and is then evaporated to dryness.—Jour. de Pharm. et de Chim., Jan. 1, 1888.

Veratrum Viride—Proper Character of the Drug.—Dr. E. R. Squibb expresses doubt whether the "rhizome and rootlets" should be the proper definition of the officinal *veratrum viride.* In all previous issues of the Pharmacopœia up to 1880, "the root" or "the rhizome" was directed, the rootlets being included for the first time in the present issue. All the recorded investigations of Osgood, Mitchell, Richardson, Scattergood, Percy, Bullock and Wood seem to have been based on the rhizome, and the author has found no recorded experience upon which the change of 1880, admitting the rootlets, is based. He, moreover, calls attention to the care necessary in the collection and preparation of the drug, which should be done at the proper season and under the supervision of a competent botanist. The common drug of the market is probably collected at any season when convenient to go for it, roughly split and dirty, with rootlets attached, and dried with little respect to its importance. He considers the properly collected, sliced and dried drug cheap at ten times the price that the carelessly prepared drug can be bought for in the market. Respecting the officinal preparation, he considers the tincture—which has probably been retained as a concession to a proprietary tincture of veratrum viride—to be superfluous. The fluid extract, which is preferably prepared by repercolation, answers all purposes of medication. The remedy should at first be given in small doses—two minims—and rather frequently, and should be diluted with water.—Ephemeris, Oct. 1887, 959–965.

Zygadenus Nuttallii—A Virulent Poisonous Western Plant.—Messrs. J. U. and C. G. Lloyd draw attention to this plant, which, with other species of *Zygadenus*, notably *Z. venenosus*, is found in the Rocky Mountain region, extending west to the coast. Dr. H. S. Goodell, who has met with a number of cases of accidental poisoning from these plants, regards them to be the most violent poisons of the vegetable kingdom. The plants have a close resemblance to the *wild onion*, as they have a white bulbous root and similar linear leaves. *Z. venenosus*, which is mentioned in the text-books under the popular names of "Hog's Potato" and "Death Camoss," has established a reputation for its poisonous properties. Dr. Goodell submitted to the authors a specimen of *Zygadenus*, which they have recognized to be *Z. Nuttallii.* He found it to be a powerful narcotic poison. The authors are engaged in investigating the nature of the chemical constituents of the plant.—Amer. Drugg., Aug. 1887, 141.

SMILACEÆ.

Convallaria Majalis—Physiological Action of its Constituents.—Dr. Nathanson records his observations in the use of convallamarin and convallarin, which lead him to consider the last named to be only capable of producing a purgative effect, while convallamarin represents a useful cardiac drug, possessing the property of promoting the re-establishment of disturbed compensation, while free from unpleasant accessory effects. He attributes the contradictory reports of other observers to the use of impure preparations.—Med. Rec., July 1887, 282.

Trillium Erectum—Proximate Examination of the Root.—Mr. D. J. Prendergast has subjected the root of *Trillium erectum* to proximate examination, believing that this species of *Trillium* is the one that furnishes the principal supply of "beth root," though other species doubtless also contribute to the supply. The air-dry powder contained 6 per cent. of moisture, and yielded 2.3 per cent. of ash. It contained 8.2 per cent. of a viscid oil, of a reddish color, soluble in ordinary alcohol, ether, petroleum ether and chloroform, and saponifiable by potassa; 4.8 per cent. of a reddish resin, soluble in ether, in alcohol and in potassa, but insoluble in water and in petroleum ether. To alcohol it yielded 18.9 per cent. of extractive matter, which contained a glucoside. This latter he believes to be identical with convallamarin. Alkaloid was not present. Neither could he detect the presence of a volatile oil, alleged to be present by former experimenters. Gum and a small quantity of an organic acid were also found.—Amer. Drugg., Nov. 1887, 206; from the author's Thesis.

IRIDACEÆ.

Saffron—Examination of Commercial Samples.—Messrs. Rietsch and Cornil have examined 79 samples of powdered saffron, and found that 49 of them were adulterated. Of these 31 contained florets of carthamus, 4 contained santalum rubrum, 1 was adulterated with curcuma domestica, and 1 was fortified with oil; 5 contained red woods and petals not determined. Seven were double falsifications, of which 4 contained carthamus with santalum or other red woods and a red flower with an admixture of oil. Red woods and amylaceous matters were also found.—Amer. Jour. Pharm., June 1888, 288; from Jour. de Phar. et de Chim., March 15, 1888.

AMOMEACEÆ.

Ginger—Comparative Value of Commercial Varieties.—Mr. Frank M. Siggins assayed several commercial varieties of ginger for the amount of resinous extract. Eight ounces of each sample in No. 60 powder were exhausted by percolation with alcohol of .820 spec. grav., the percolate was distilled until about one fluidounce remained, which was evaporated in a tared capsule by means of a water bath until it ceased to lose weight. The results were as follows:

I.	Jamaica, unbleached	5.0	per cent.	resin.
II.	Jamaica, bleached	4.8	"	"
III.	East India	6.65	"	"
IV.	East India	6.57	"	"
V.	African	6.17	"	"
VI.	African	7.0	"	"

These results agree with those of former investigators, showing that African and India gingers yield more resin than does Jamaica ginger, and would seem to be preferable to the latter for medicinal use. The unbleached Jamaica ginger was also treated with petroleum benzin, but this menstruum yielded only 2.62 per cent. of resinous extract.—Abstract from the Author's Thesis in Amer Jour. Phar., June 1888, 278.

Chinese Ginger—Exceptional Quality.—It is stated that recently a company has been formed in China which dries fresh ginger by special apparatus, and thereby renders it capable of being exported. It is said that the fresh roots are deprived of about 90 per cent. of their weight by the removal of water and of starch, and that the remaining 10 parts constitute the valuable aromatic portion. The process reduces the root to powder. A sample of this powder was submitted to Messrs. Schimmel & Co., of Leipzig, who pronounce it as having a finer aroma than any other kind of ginger that they have ever met with.—Amer. Drugg., May 1888, 92.

Turmeric—Preparation of a Test Paper Sensitive to Acids—See *Turmeric Paper*, under "Pharmacy."

Hamama—Botanical Source.—Mr. E. M. Holmes has determined the drug sold under the names of *hamama*, amamoon, or amooman in the Bombay market, to be derived from

Dionysia diapensiæfolia, Boiss.—The drug corresponds exactly with the figure given by Clusius in his "Exotica" under the name of *Amomum spurium*, which the author identifies as above. The drug had for some years remained unidentified in the Museum of Kew, and in that of the Pharmaceutical Society. It occurs in tufted masses, the size of a man's fist, or larger, and reminds one of the *Sphagnum* seen in the turf bogs in Europe. Persian writers speak of several kinds of the drug, one of them being stated to grow in water.—Pharm. Jour. and Trans., Aug. 20, 1888, 151–152.

Hygrophila Spinosa—Remedial Value.—Mr. Jayesingha communicates a series of experiments with *Hygrophila Spinosa*, a plant which is considered by the native practitioners in Ceylon as one of the best remedies for dropsy. The author's results were very satisfactory, four out of six patients being cured of dropsy by the use of the drug. He employed it in the form of infusion, 2 ounces of the plant being infused in 1 pint of boiling water for half an hour, and strained. This quantity is administered during twenty-four hours, in divided doses.—Pharm. Jour. and Trans., Aug. 27, 1887, 170, from Brit. Med. Jour., July 16, 1887, 118.

ORCHIDACEÆ.

Vanilla—Collection, etc., in Mexico.—According to C. B. Pedretto, vanilla flourishes in two places in Mexico, viz: Papantea, in the state of Vera Cruz, and Misantia; but the first place is the most important. This town of about 10,000 inhabitants, is in the land of the Toconaco Indians, who are as indolent and impoverished as any people on earth. Vanilla is found wild in the forests around Papantea, clinging to the trees and bushes for support. When the beans ripen in November or December, the natives go out into the forests to gather them. All kinds are put into sacks together and brought into Papantea, to market, where they are purchased by middlemen, who assort and cure them. One thousand good sized green vanilla beans will weigh 60 pounds, the same when cured about 10 pounds. The first fine morning, planks are arranged and covered with quilts, on which the beans are laid after being divested of their stems. The sweating process, as it is called, then takes place, and has to be repeated several times before all the water has evaporated. Then the beans are heated slightly and placed on shelves to dry and air. After this they are assorted in lots of fifty beans, graded according to length. In fine weather the curing process takes three weeks, but such weather rarely prevails, and the curing sometimes takes four or five months. The vanilla is becoming an important article of Mexican commerce, 60,000,000 beans having been exported last year from Papantea alone.—Amer. Drugg., April 1888, 69; from "St. Louis Republican."

Cypripedium Parviflorum—Proximate Analysis.—Mr. E. S. Beshore has made a proximate analysis of the rhizome and rootlets of *Cypripedium parviflorum*, with the following results :

Fixed oil	.48	per cent.
Volatile oil and acid	.02	"
Resin soluble in chloroform, alcohol, etc	1.53	"
Other compounds soluble in ether	.49	"
Glucose	2.34	"
Resin and phlobaphene	3.08	"
Mucilage	3.92	"
Dextrin	.88	"
Saccharose	4.44	"
Albuminoids	6.00	"
Starch	6.56	"
Cellulose and loss	49.15	"
Moisture	12.55	"
Ash	5.98	"
Undetermined	2.58	"
	100.00	"

—Amer. Jour. Pharm., Aug. 1887, 395.

ARISTOLOCHIACEÆ.

Aristolochia Reticulata, Nuttall—Proximate Analysis.—Mr. James Adams Ferguson has subjected (the rhizome and roots of? Rep.) *Aristolochia reticulata* to proximate examination, with results as tabulated below. The more important constituents found are a volatile oil and an alkaloid. The

Volatile Oil, of which about one and a half fluidounces was obtained from ten pounds of the drug, was amber-yellow, aromatic in odor, and camphoraceous to the taste ; sp. gr., 0.975 ; b. p., 205° C. ; did not congeal after exposing two hours to —15° C. The alkaloid, for which the author proposes the name

Aristolochine, is probably identical with the "bitter principle" of Chevallier and Feneulle. It was obtained in the form of light yellow needles, which on being heated with soda lime evolved ammonia. The crystals are inodorous, very bitter, and are soluble in water, 95 per cent. alcohol, ether, chloroform and benzol. With concentrated H_2SO_4, a reddish-brown color; with fuming HNO_3, colorless; with H_2SO_4 and a crystal of $K_2Cr_4O_7$, a brown color, changing to brownish-green; with concentrated H_2SO_4 and HNO_3, a pink color; with concentrated HCl, a pink color, and with Froehdes' test, a blackish-brown color.

The author tabulates the results of the proximate analysis as follows:

Soluble in petroleum spirits	4.20	
Volatile oil		1.00
Resin		3.20
Soluble in stronger ether	1.90	
Resin		1.90
Soluble in absolute alcohol	1.80	
Tannin, soluble in water		.82
Aristolochine, (approximately)		.03
Phlobaphene insoluble in water		.05
Soluble in distilled water	8.00	
Mucilage		.60
Dextrin		.80
Glucose		.72
Malic acid and extractive matter		5.88
Soluble in caustic soda solution (0.2 per cent.)	3.10	
Albuminoids		.60
Extractive matter		2.50
Soluble in diluted hydrochloric acid (1 per cent.)	24.40	
Pararabin		1.80
Starch		6.48
Oxalate of calcium		.53
Albuminoids and extractive matter		15.59
Loss by chlorine treatment	5.78	5.78
Residue	23.09	
Cellulose and lignin		23.09
Ash	11.40	11.40
Moisture	10.70	10.70
Loss	5.63	5.63
	100.00	100.00

—Amer. Jour. Pharm., Oct. 1887, 481–483.

Aristolochia cymbifera, Mart.—*Re-appearance in the European Market.* —In "Chemiker Zeitung" (1887, 379,) attention is drawn to the fact that the root of this plant has again appeared in the European drug market, and consists of pieces about 10 cm. (4 inches) long, gray-brown, longitudinally wrinkled, the thickest roots being split; the transverse section shows a rather thick bark, and a ligneous cylinder, which is distinctly radiating, and contains wide dotted ducts and wood-fibres; the bark and medullary rays contain much starch, and in numerous but slightly enlarged cells, a mixture of yellow resin and volatile oil.

The root is known in Brazil as *milhomem*, also as *jarra* and *jarrinha*, and has a camphoraceous odor, resembling that of serpentaria, and a bitter and pungent taste. The roots of a number of other species of Aristolochia have similar properties, and are also used under the same names as the preceding, the medical properties being analogous to those of serpentaria. The drug has been repeatedly used in Europe during the last century and more recently, but does not appear to be superior to other well known remedies.—Amer. Jour. Pharm., Sept. 1887, 448.

Asarum Europæum, L. *and A. Canadense.*—Examination of their *volatile oils*, which see under "Organic Chemistry."

SANTALACEÆ.

Red Sandal Wood—Determination of Two New Crystalline Compounds.—Messrs. Cazeneuve and Hugouneng have isolated from red sandal wood two new crystallizable bodies, which they have named respectively "pterocarpin" and "homopterocarpin." The first is present to the amount of about 1 per cent., the second to the amount of 5 per cent. The authors describe the method of preparation.

Pterocarpin, $C_{10}H_8O_3$, is a colorless body, strongly dextrogyre, insoluble in water and in cold alcohol, soluble in hot alcohol and in chloroform, crystallizing from the latter solvent in splendid klinorhombic columnar crystals. When melted with KHO, it develops a cumarin odor, in nitric acid it dissolves with a green color.

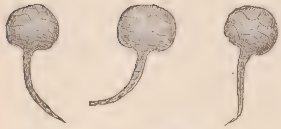
Homopterocarpin, $C_{12}H_{12}O_3$, is also colorless dextrogyre (though not as strongly so as pterocarpin), soluble in ether, chloroform, benzol, bisulphide of carbon, and hot alcohol. It crystallizes in long needles, quite distinct from the previously described compound. The two bodies being separated by means of bisulphide of carbon, in which pterocarpin is completely insoluble. By melting homopterocarpin with KHO, it is decomposed into carbonic acid and phloroglucin.—Arch. d. Pharm., Nov. 2, 1887, 1022; from Jour. Pharm. Chim., xvi. 154.

PIPERACEÆ.

Cubebs—Distinction between the Ripe and Unripe Fruit.—At the London drug sales during December some excellent samples of genuine cubebs were exhibited, accompanied by others, of a pale yellow color, not unlike that of "yellow berries," and which evidently consisted of unripe fruit. Both the ripe and unripe berries gave the beautiful carmine rose color with concentrated sulphuric acid characteristic of the genuine drug, but the unripe ones, when bruised and boiled in water, did not give the deep blue coloration with tincture of iodine, although it was readily obtained with the ripe berries. The unripe berries possessed, however, a considerable amount of aroma, and would doubtless yield essential oil on distillation.—Pharm. Jour. and Trans., Dec. 3, 1887, 461.

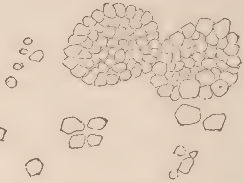
False Cubebs—A New Variety.—Mr. Wm. Kirkby draws attention to a new kind of spurious cubebs which are distinct from those previously described by him (see Proceedings, 1885, 187–188). The author's paper gives a description of the histological characters of the spurious article and is accompanied by illustrations. In the unground state the spurious article may be distinguished from cubebs by its larger size, less wrinkled surface, flattened pedicel, its cajuput odor when bruised, and by giving no carmine color when crushed on a white surface, and treated with strong sulphuric acid. From the "short-stalked" variety it may be known by its longer pedicel, darker color and different odor. In the powder it may be at once recognized by its characteristic starch bodies.

Fig. 8.



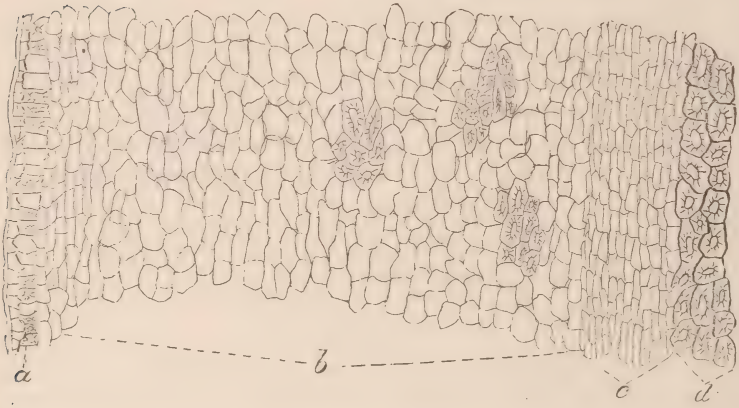
False Cubebs.

Fig. 9.



Starch of Spurious Cubebs x 620.

Fig. 10.



Section of Pericarp : *a*, epidermal layers; *b*, epicarp ; *c*, mesocarp ; *d*, endocarp, x 62.

—Amer. Jour. Pharm., Nov. 1887, 571–574; Yearbook of Pharmacy, 1887.

LAURACEAE.

Cinnamon—A South American Product.—At the exhibition of South American products held at Berlin in the early part of 1887 some cinnamon bark was exhibited which Professor Tschirch considers fully equal in aroma and sweet taste to the Ceylon cinnamon. It was in pieces about two inches broad and three-eighths of an inch thick. The essential oil prepared from it by the author could not be distinguished from that of the Ceylon bark, though the yield was smaller. This is due to the fact that the pieces are taken from the older branches, which have a bark rich in stone-cells, and therefore poorer in oil-cells.—Amer. Drugg., Nov., 1887, 216.

Cryptocarya Australis—Physiological Action of the Alkaloid from the Bark.—Dr. Bancroft has investigated the physiological action of the bark of *Cryptocarya australis*, a small tree which is plentiful about Brisbane. The bark has a persistently bitter taste, due to the presence of an alkaloid which crystallizes in stellate masses of acicular crystals. When administered to warm-blooded animals the alkaloid produced difficulty of respiration, ending in asphyxial difficulty and death. It also has poisonous action on cold blooded animals belonging to the reptilia. Another Queensland plant examined by Dr. Bancroft, belonging to the same natural order, is

Daphnandra Repandula—Physiological Action, etc., of the Alkaloids from the Bark.—The bark of this tree has a transient bitter taste, and when first removed from the tree it has a yellow color on the inner surface, which changes to a metallic black on exposure to the air, but becomes yellow again when dry. Infusions of the bark have a yellow color, and remain free from micro-organisms when kept. The extract of the bark does not appear to contain either gum or resin, but is rich in alkaloids, which are colorless when pure, one being active and easily separable from the others. Its poisonous action is chiefly due to its action on the heart, is to some extent antagonistic to strychnia, and also retards the development of septic organisms, deodorizes putrid meat, and checks the growth of yeast.

Daphnandra micrantha, which is a shrub, also grows near Brisbane, and possesses an active principle similar to that in *D. repandula.*—Pharm. Jour. and Trans., Oct. 1, 1887, 278; from Austral. Jour. Phar.

MYRISTICACEÆ.

Myristica Surinamensis—Character and Examination of the Seed.—Mr. A. Tschirch calls attention to some seeds of a *Myristica* which were exhibited in the South American Exhibition in Berlin, in 1886, and which a nearer examination identified with the seeds of *Myristica surinamensis*. The seeds have been a commercial article for some years under the name of

Ucuhula, and proved to be very rich in a solid fat, having a yellow color, melting at 36° C., and amounting to 72.5 per cent. of the seed. Their morphological characters deviate considerably from the ordinary nutmeg. They are round or only slightly oval, 1.5–2 cm. in diameter, of a light-brown color, but almost always covered by an ebony-colored, thin, friable testa, which distinctly shows the impressions of the avillus, and amounts to 12–18 per cent. of the entire seed. The surface of the kernel is dull, delicately veined, brittle, and easily scratched with the finger-nail, the abrasions produced exhibiting the somewhat darker color of the inner cuticle of the seed. Anatomically the ucuhula seed possesses on the whole similar characters to those of other kinds of myristica. The most distinguishing characters, however, are the occurrence of very large, regular and handsomely formed albumen crystalloids, there being probably no other instance in the entire vegetable kingdom in which these crystals occur in as magnificent a form. The nearest approach to these crystals is found in the seeds of *Myristica Bicuiba*, but they are not nearly so regular in form, showing a tendency to twin-formations. In the seeds of *M. fragrans*, well formed aleuron crystalloids are much more rare. The author's paper is illustrated by a cut showing these crystals, the accompanying globoids, and crystals of oxalate of calcium, besides which the aleuron grain occasionally also contains vests of an amorphous body—the plasma membrane.—Arch. d. Pharm., July 2, 1888, 619–623.

POLYGONACEÆ.

Rhubarb—Distinction of the Chinese from the European Drug by the Yield of Ash.—Dr. Boni states that Chinese rhubarb may be distinguished from European by the higher yield of ash in the former, which amounts to 20 to 25 per cent. against 8 to 11 per cent. in the latter. The difference is due to the presence in Chinese rhubarb of a large proportion of oxalate of calcium, which may be recognized in form of crystalline particles, resembling sand, when the powdered drug has been exhausted successively with water, strong alcohol and benzol. The same residue from the European drug does not contain these white grains, but appears like ordinary sawdust. By treating the residue with dilute nitric acid, the oxalate of calcium is dissolved, and in adding ammonia in excess to the filtered solution, it is then thrown down again as a white precipitate, abundant in the case of Chinese rhubarb, very slight otherwise.—Pharm. Era, April 1888, 135; from Pharm. Post, Jan. 22, 1888.

English Rhubarb—Similarity to the Dark-Veined East Indian Variety.—Referring to a former paper (see Proceedings 1885, 117), in which he had stated that of the two cultivated products of *Rheum officinale*, that known as "ordinary cultivated" was superior to that known as "highly cultivated," Mr. W. Elborne draws attention to the great similarity in appearance at the present time between the cultivated rhubarb (ordinary cultivated) from *R. officinale*, and of the dark-veined variety of East Indian rhubarb. The rhubarb is produced solely on the estate of the late Rufus Usher.—Yearbook of Pharmacy, 1887, 475–476.

CHENOPODIACEÆ.

Phytolacca decandra, Lin.—*Proximate Examination of the Root.*—Mr. Wm. A. Partee has examined poke root according to the scheme of Dragendorff. The air dry root contained 10 per cent. of moisture, and yielded 11.2 per cent. of ash. Petroleum spirit extracted 0.23 per cent.; ether, 0.18 per cent.; absolute alcohol, 1.42 per cent.; water, 15 per cent. The author has not established the presence of any important substances.—Amer. Jour. Phar., March 1888, 123.

Petiveria Hexaglochin, Fischer.—The root of the plant which, under the name of

Pipi root, attracted some attention in Europe sixty years ago, and was then described by Ach. Richard, has again made its appearance in the European market. It is described as consisting of irregularly bent pieces, 3 to 6 mm. (⅛–¼ inch) thick, externally gray-brown, upon transverse section showing a brownish bark with white dots, and a lighter colored radiating ligneous cord. The cork-layer consists of 3 or 4 rows of cells; the comparatively thick primary bark contains a number of enlarged cells, enclosing one or two large, or many small, crystals of calcium oxalate; the woody cord contains tracheïds with narrow dotted ducts, two-rowed medullary rays, and in the centre a thin pith. The root is recommended as an emmenagogue.

The genus Petiveria is confined to tropical America, and the shrubby or suffruticose plants are mostly acrid and have, particularly in the root, an alliaceous odor. Richard referred pipi root to Pet. alliacea, Lin., and Martius (Buch. Rep., 1824, xvii., p. 175), to Pet. tetrandra, Gomez. The root has been used internally and in baths and fomentations, as a diaphoretic, stimulant, expectorant, anthelmintic, and in fevers, toothache, and gonorrhœa.—Amer. Jour. Pharm., Aug. 1887, 428–429; Chem. Ztg., 1887, 348.

PLANTAGINACEÆ.

Plantago Pysllium—Value as a Substitute for Flaxseed and as Mucilage.—Mr. Langlebert recommends the seeds of *Plantago Pysllium* for internal administration in preference to linseed, inasmuch as it is more readily and quickly acted on by cold water, yields a proportionally larger quantity of mucilage, is more quickly acted on by the saliva, and in presence of gastric juice the mucilage shows evidence of partial digestion, which is not the case with linseed mucilage. The administration of the whole seeds has the advantage of the gradual production of the mucilage throughout the alimentary canal, and of the presence of the oil of the seed to add to the demulcent effects.—Phar. Jour. and Trans., June 30, 1888, 1089; from Arch. de Pharm., 1888, 262.

Plantago Ispaghula—Use of the Seed.—Attention is drawn to the value of "spogel" seeds in diarrhœa. One part of the seeds yields with twenty parts of water a tasteless jelly, which is preferable to the jelly of quince seed. The entire seeds are also given internally; they swell considerably from the absorption of moisture, and in the large intestines give off a quantity of thick mucilage.—Jour. de Méd. de Paris, Sept. 4, 1887, 329.

SCROPHULARIACEÆ.

Digitalis—Amount of Digitalin in Different Preparations.—Mr. Lewis A. Crull has examined different preparations made from digitalis leaves, with the view of ascertaining their quality. Using 100 gm. of the leaves and following the pharmacopœial process of 1870, he obtained 2.5 per cent. (? Rep.) of digitalin; the abstract yielded 2.35 per cent., the extract 2.25 per cent., the fluid extract 2.5 per cent., and the tincture 0.4 per cent. of digitalin. Six commercial fluid extracts varied in specific gravity between 1.014 and .956, and yielded from 1.97 to 2.5 per cent. of digitalin.—Amer. Jour. Phar., Dec. 1887, 610.

Digitalis—Comparative Value of the Different Substitutes.—Professor Luciani, after a careful study of the various agents that have been introduced as substitutes for digitalis, finds that

Strophanthus and *Adonis Vernalis* have nearly the same action on the heart that digitalis has, and are to be preferred, because they have no cumulative action and no injurious influence over digestion.

Caffeine does not answer the purpose so well, and is apt to disturb digestion.

Lily of the Valley is greatly inferior in activity, although in some mild cases it may be useful.

Sparteine is of no practical value, having little influence over irregular heart action, and producing, moreover, headache and other disagreeable effects.—Pharm. Era, May 1888, 178.

SOLANACEÆ.

Solanum Grandiflorum, var. *Pulverulentum—Isolation and Characters of an Alkaloidal Constituent.*—Mr. D. Freire has obtained from the fruit of this plant, the so-called "wolf-fruit" of Brazil, an alkaloid by a process which he describes. He proposes for the new base the name of

Grandiflorine, and describes it as a white substance, having a very bitter taste, insoluble in water, but soluble in alkalies and dilute acids. When heated with potassium hydroxide it gives off ammonia, and its solution gives the usual reactions for alkaloids. The molecular weight as determined by means of the platinum compound is 236.4. It is an energetic poison.—Pharm. Jour. and Trans., March 3, 1888, 748; from Compt. Rend., cv. 1074.

Atropa Mandragora—Recent Researches.—Dr. B. W. Richardson in "The Asclepiad," gives an historical sketch of *Atropa Mandragora*, or more particularly the wine prepared from the root, which was known by the ancients under the name of

"Morion," or "Death Wine," said to have been administered to persons who were being subjected to torture or to prolonged and painful death. In his more recent researches, Dr. Richardson has essayed to make a tincture with strong alcohol from some roots presented him by the late Mr. Danl. Hanbury; but the tincture was negative in its action. His error was the employment of strong alcohol, and by employing a very weak alcohol—containing only one-sixth spirit—he obtained an active preparation. This relation of the active portion of mandragora to solvents was recognized by the ancients, who made infusions and decoctions and afterwards added wine or used wine direct for the extraction. Such preparations, indeed, are mentioned by Dioscorides. Dr. Richardson's experiments made with the weak alcoholic tincture—the strength of which he however fails to give—upon both man and animals, confirm the observations of the older writers. It appears, moreover, to possess the properties of a good local anæsthetic, which, with all our advances, is still a desideratum. Its action, no doubt, depends on the presence of an alkaloid which is like, if not identical with, atropine, and this he thinks would prove one of the most powerful anæsthetics we have yet discovered. —Pharm. Jour. and Trans., June 16, 1888, 1049–1050.

Belladonna—Relative Value of Fresh and Dried Leaves for Preparing the Extract.—Mr. A. Bilteryst finds that a kilogram of fresh belladonna leaves, gathered when the flowering has just commenced, yielded 20 grams of extract, and the same quantity of leaves yielded 142 grams of dried leaves, which afforded exactly the same amount of extract, viz., 20 grams. 140 grams of the dried leaves yielded 21 grams of extract, but this contained only 5 mgm. of atropine per gram, whereas the extract made according to the Codex, from the fresh leaves, contained 12.5 mgm. per gram. He attributes this difference to the fact that the commercial leaves were collected when part of the active principle had passed into the berries, some of the latter having been found among the leaves.—Pharm. Jour. and Trans., Oct. 1, 1887, 279; from Jour. de Pharm. d'Anvers, 1887, 411.

Belladonna Roots—Localization of Atropine.—Mr. A. Wèvre describes a means of demonstrating the position of atropine in the tissues of belladonna. He states that the best reagent is a solution of iodine in iodide of potassium, although phosphomolybdic acid also gives very satisfactory results. By the former a brown precipitate is produced in the tissues, and after a time stellate crystals of a metallic lustre are formed. The latter reagent produces a yellowish precipitate. The longitudinal sections give better results than transverse ones. The alkaloid is found to occur principally in the epidermis and subjacent parenchyma, and in the bast parenchyma. Old roots contain less atropine than young specimens, and the atropine appears to become more and more localized in the bark as the plant becomes older. He has not been able to detect any in the liber, wood or cambium cells.—Pharm. Jour. and Trans., March 31, 1888, 825; from Jour. Pharm. Chim., March 1, 1888, 262.

Scopolia Japonica—Alkaloidal and Non-Nitrogenous Constituents.—Messrs. Ernst Schmidt and Hermann Henschke have subjected the alkaloidal constituents of Japanese belladonna root (*Scopolia japonica*) to comprehensive chemical examination. The results show that of the two substances which have been recently introduced in commerce under the names of "scopoleïn" and "rotoin," scopoleïn has apparently no existence. By appropriate methods, which the authors describe, they have found the crude alkaloidal substance of scopolia root, called scopoleïn by Eykman, to be composed of the three well-known mydriatics, atropine, hyoscyamine and hyoscine. Choline is also found to be a constituent. These appear to be present in very variable quantities, leading to the supposition that the age of the plant, the locality, the time of collection, etc., materially influence both the total amount and the nature of the alkaloidal constituents. Mr. Henschke, individually, also subjected the non-nitrogenous constituents to nearer examination. He had found during the above experiments with the crude alkaloids, that they contained the glucoside "scopolin" as well as its decomposition product "scopoletin." Mr. Henschke's experiments identify scopoletin with "chrysatropic" acid. Respecting "rotoin," the author has subjected the substance of commerce under that name to examination. He obtained the products of two different manufacturers; the one proved to be a saponaceous product, that is to say, an alkali salt of fatty acids rich in carbon; the other, a mixture of atropine and hyoscyamine, accompanied by a large quantity of scopoletin and of resinous bodies.—Arch. der Pharm., March 1, 1888, 185–205 and 205–214.

Scopolia Hlardnakiana—Alkaloidal Constituents.—Mr. Ernst Schmidt has also examined the alkaloidal constituents of the root of *Scopolia Hlardnakiana* by the same method as that pursued in the examination of *S. japonica.* He found it to be composed of *hyoscyamine* exclusively, finding neither *atropine* nor *hyoscine.* It is not impossible, however, that under different conditions of growth, age, locality, etc., it may also contain the two last named alkaloids.—Ibid., 214–215.

OLEACEÆ.

Olives—Cultivation in California.—Mr. James E. C. Bell draws attention to the success attending the cultivation of the olive tree in California. The trees are now being extensively planted, and the day is not far distant when the difficulty of getting pure olive oil will not be as great as it is now. The climate and soil of California are peculiarly adapted to olive culture, the chief difficulties now in the way being the high price of land and labor. These obstacles will doubtless be gradually overcome, and then pure olive oil will be obtainable at a much lower price than at present. The following respecting the method of cultivation and the preparation of the oil may properly find space here:

The trees are propagated from cuttings taken from sound growing trees, during the months of December and January, and carefully trenched in a loose, sandy soil, in a shady place. The ground of the intended orchard is thoroughly prepared by proper cultivation, and in

February or March the cuttings are permanently planted about twenty feet apart. Theoretically, the trees should be propagated from the seeds, as they would be better rooted and more symmetrical, but in practice this method has not proved successful. The trees usually produce some fruit the fourth year from planting, and thenceforward the yield increases, alternating a light with a heavy crop. A few trees at four years have produced over two gallons of olives, and at eight years thirty gallons. The average yield is, of course, much smaller than this. A tree in the San Diego Mission orchard has produced 150 gallons of berries in a year. The fruit is generally ready for picking in November, but sometimes is not sufficiently matured before the middle of January. The oil made from olives picked before fully ripe, and just after they become purple, is lighter in color and more fragrant than that from riper fruit. The picking is done by means of ladders attached to wagons which are driven from tree to tree. This method is preferable to that employed in Europe, where the fruit is knocked with poles and picked from the ground.

After picking, the fruit is freed from leaves and imperfect berries by passing it through a winnowing mill, when it is either dried in the sun for about two weeks, or exposed to artificial heat at a temperature of 110° to 130° F. When the moisture has been sufficiently evaporated, the fruit is crushed by stone rollers, and pressed out in a manner almost identical with that used in the old-fashioned beam cider-press. The cheeses are three feet square and three inches thick, enveloped in coarse linen cloth, about ten cheeses being put in at one pressing. The expressed liquid is allowed to stand in tanks from two to three months, by which time the oil rises to the top and is drawn off. The pomace is re-crushed, treated with hot water, and, on pressing, a second quality of oil is obtained. The oil is clarified by being passed through a filtering column composed of five or six compartments with sieve bottoms on which cotton batting is placed. Heat facilitates this process, but is liable to injure the oil, and hence is not used in filtering the best oil. The oil is finally bottled, kept in a moderately cool place, not exposed to sunlight, and agitated as little as possible.—Amer. Jour. Pharm., March 1888, 124–126.

Olive Oil—Production in Australia.—Mr. W. E. Mathews states that for many years past the cultivation of the olive has been carried on as an experiment in various parts of the Australian colonies. The experiment of acclimatizing has been generally successful, and encouraging results have been obtained in South Australia and in the northern district of Victoria, where the culture is now being profitably continued, although not at present to any very great extent. It is notable that the production of good virgin and commercial olive oils has been effected. On the Beaumont estate, near Adelaide, there are some 1200 to 1500 trees yielding on an average about a hundred weight of fruit. About 1500 gallons of oil are made annually on this estate. Mr. Mathews has examined colonial oils from these estates, and two others, and found them highly satisfactory both as to purity and quality, and comparing well with the very best grades of imported olive oil.—Austral. Pharm. Journ., August 1887, 279–280.

ACANTHACEÆ.

Adhatoda Vasica, Nees—*Chemical Examination of the Leaves.*—Mr. David Hooper communicates a description of *Adhatoda vasica, Neese,* embracing its botanical characters, habitat, vernacular names, uses in medicine, the arts and agriculture, and gives the results of his chemical examination of the leaves, which under the name of

Vasaka have a reputation in India as expectorant and antispasmodic. The plant is a dense shrub, 4–8 feet high, sometimes arborescent and 20 feet high. The leaves are opposite, elliptic, acute at both ends, entire, smooth or minutely pubescent, 6 to 8 inches long, and 1½ to 3 inches broad, the pellicle being 1 inch long. When dried and powdered, they have a light green color, with a strong peculiar odor and a bitter disagreeable taste. The following table gives the results of this proximate analysis:

Volatile odorous principle	0.20
Chlorophyll, fat, resins and alkaloid extracted by ether	3.20
Adhatodate of vasicine, resin, and sugar extracted by alcohol	12.50
Gum	3.87
Coloring matter precipitated by lead	4.83
Other organic matters and salts extracted by water	10.38
Extracted by soda solution	4.72
Residue, organic	40.71
Residue, inorganic	9.59
Moisture and loss	10.00

The ash obtained on incineration amounted to 17 per cent., of which 23.38 per cent. was soluble in water, 75.12 per cent. soluble in acid, and 1.50 per cent. remained undissolved. The most important principle isolated by the author is an alkaloid, which he has named

Vasicine, after the sanskrit name (vasaka) of the plant, which appears to exist naturally in combination with a peculiar acid, named by the author, "adhatodic acid." Vasicine constitutes the bitter and active principle. It was obtained in white transparent crystals belonging to the square prismatic system; is odorless, decidedly bitter, soluble in water, with an alkaline reaction, in ether, and more so in alcohol. It readily forms salts with sulphuric, hydrochloric, nitric and acetic acids, which are crystalline, and their solution may be evaporated without apparent decomposition. Its solutions are precipitated by the usual alkaloid reagents. By distillation with strong potash, it yields an oily body resembling chinolin, together with ammonia and other volatile bases.

Adhatodic Acid, which is obtained from the lead salt by HS, is soluble in water and spirit, has an acid reaction, and is presumably the yellow coloring matter of the leaves, which are used as a dye in combination with indigo, forming a useful green.—Pharm. Jour. and Trans., April 7, 1888, 841–842.

LABIATÆ.

Scutellaria lateriflora—Proximate Constituents.—Mr. Henry A. Howard, following the usual plan for the analysis of plants, found the officinal scullcap to yield the following constituents: Wax, chlorophyll, volatile oil, tannin, resin, extractive matter, gum, glucose, and an acid volatile principle. Considering the latter the active principle, the author examined the precipitate always produced in the fluid extract on standing, and finds this to contain some of the acid constituent. He therefore suggests a modification of the menstruum for the fluid extract (which see), in which no precipitate had formed after standing several months.—Amer. Drugg., Dec. 1887, 222; from the Author's Thesis.

Lavendula Spica.—Presence of the essential oil of *Eucalyptol,* which see under "Organic Chemistry."

Patchouli Leaves—Cultivation and Substitution.—Mr. J. R. Jackson remarks concerning a sample of patchouli leaves lately received from Penang, as the result of an experimental trial in cultivating and harvesting the plant, that one sample consisted of the leaves of *Urena lobata,* var. *sinuata,* which it seems is largely used for adulterating the patchouli of the market. Mr. Jackson also points out that *Pogostemon suavis,* Tenore, and *Plectranthus Patchouli,* have the same odor. The demand for the leaves and essential oil is steady and continuous. The leaves of *Urena lobata* bear a strong resemblance to the second form of adulteration of patchouli leaves, described by Dr. Paschkis, and agree with the latter in the presence of stellate hairs. In true patchouli, the hairs of the leaves are all simple and four-celled. Dr. Paschkis, however, does not mention the oval slit gland which is characteristic of the leaves of *Urena lobata,* and may be found near the base of the central nerve at the back of the leaf.—Pharm. Jour. and Trans., Dec. 3, 1887, 461; from Gardn. Chron., Nov. 19, 1887, 617.

Patchouli—Cultivation.—Respecting the cultivation of patchouli, it is stated in the "Kew Bulletin" that patchouli leaves appear to lose fully three-quarters of their weight in drying. It is calculated that an acre of patchouli will yield about a ton of leaf per annum. It is suggested that in cutting one side of the plant should be cut first and then the other, so as to cause less check to the growth of the plant. The leaves need to be dried slowly, and not to the point of crispness, otherwise they get broken to powder in packing.—Pharm. Jour. and Trans., June 2, 1888, 1009.

Mentha Piperita and M. Viridis—Distinctive Anatomical Character-

istics.—In his work on the anatomy of officinal leaves and herbs, Mr. A. Meyer remarks that the anatomical characteristics of *Mentha piperita* and *M. viridis* are little distinctive. Mr. Joseph Schrenk thinks that the occurrence of menthol crystals in the glandular hairs of *M. piperita*, and their absence in those of *M. viridis*, enables the distinction of the smallest fragments of the two drugs with almost absolute certainty. Mr. Schrenk has examined the leaves of spearmint collected in various localities, and was unable to detect any of the prismatic, needle-like crystals of menthol, which are found, sometimes singly, but most frequently in large conglomerations, in almost every glandular hair of *M. piperita*. As the crystals are doubly refractive, they can be seen very easily by means of the polariscope. In ordinary light it is often impossible to distinguish them. A fragment of the leaf is soaked in water, and may then be examined without any further preparation with a $\frac{1}{5}$ to $\frac{1}{6}$ in. objective. It is remarkable how long these crystals will remain in dried leaves. Fragments from an herbarium specimen gathered in Europe in 1827 contain them in as perfect a condition as leaves of plants collected quite recently. It seems to be doubtful if the crystals in the glands of *M. piperita* are pure menthol. It was thought possible that their distinctive yellow color was due to the oil in which they are embedded; but when the oil is removed, the yellow color remains. More remarkable, however, is the fact that alcohol does not dissolve the crystals, for leaves that have been kept in alcohol for several weeks have still retained them. Even heating in water up to the boiling point does not affect them, though continued boiling will remove them.

The author also draws attention to a distinction in the inflorescence of the two species, which seems to have escaped notice thus far. With both, the spike of flowers terminating the main stem is much higher than all the lateral ones, at the *earlier* stage of flowering (in July). But when the spike of *M. piperita* has done flowering (in August), it is soon overtaken and even overtopped by the lateral, lower branches, so that the upper part of the cymose inflorescence assumes the appearance of a corymb. *M. viridis* does not behave in this manner, the terminal spike always remaining much higher than all the others. These differences are shown by cuts of the inflorescence of the two plants at the latter stage, which see in Amer. Drugg., June 1888, 101.

Peppermint Plants—Treatment and Distillation.—Mr. Albert M. Todd contributes an interesting paper on the proper treatment and distillation of peppermint plants, from which it appears that it is desirable on several grounds to dry the plants before distillation. There is no perceptible loss in volatile oil by this treatment, while the distillation is accomplished with three times the rapidity than from the green plants. The paper will be consulted with interest.—Proc. N. Y. State Pharm. Assoc., 1888, 178–182.

Lamium Album—Use as a Hæmostatic.—Dr. Florain considers *Lamium album* to be fully equal to the *urticeæ* as a hæmostatic. He claims great success with a preparation composed of the tincture, 100 gm., simple syrup 50 gm., and water 25 gm. Dose, a tablespoonful every half hour until the hemorrhage ceases; then, the same dose every few hours. Dr. Florain believes he has separated the active principle of the plant in the form of an alkaloid, which he names *lamine*, but the characters of this compound, as well as the process of its preparation, point to the fact that the supposed alkaloid is nothing more nor less than *calcium sulphate*.—Amer. Jour. Pharm., Aug. 1887, 402; from Bull. Gén. de Thérap., 1887.

Stachys Bulbifera—A New Vegetable.—Mr. Paillieux has successfully cultivated this "new vegetable," of Japanese origin, on his farm near Paris. It is a tuber formed of successive nodes, and is from 3 to 5 centimetres in length. The plant attains a height of 25 to 40 centimetres, and grows rapidly, requiring little care. The tuber has the color and consistence of salsify, the taste resembles that of the artichoke, and it may be stewed or fried, and can be eaten with vinegar, like a salad.—Amer. Jour. Pharm., Feb. 1888, 101; from Arch. de Phar., Dec 5, 1887.

Lallemantia Iberica—Characters of Fixed Oil.—Mr. L. Richter has examined the fixed oil from *Lallemantia Iberica*. It is light yellow in color, and dries more rapidly than linseed oil. Its s. g. at 20° C. is 0.9336; congealing point, 35°; melting point of the fatty acids, 22.2°; congealing point of the fatty acids, 11°; Hehner's number, 93.3; West-Knight's number, 94; Reichert's number, 1.5; Kottendörfer's number, 184.9; iodine number of the oil, 162.1; iodine number of the fatty acids, 166.7; oxygen number of the oil, 15.81; oxygen number of the fatty acids, 16.58.—Pharm. Post, Jan. 22, 1888, 50; from Landes Vers. Stat. xxxiv., 383.

Orthosiphon Stamineus—Commercial Characters of the Leaves and Uses.—This drug, which was introduced a short time ago as a remedy in various urinary disorders, is said to be met with in German commerce in the form of rolled leaves like tea. The leaves when soaked in water and unfolded, are seen to be small, oval, and finely toothed, their upper surface deep green, the lower somewhat lighter. The lateral veins proceed to the margin and follow the latter to a point where they run together. Mr. Perinelle describes the preparation of a tincture and an extract: the former being made by macerating the finely-cut and bruised leaves in 10 parts of alcohol for ten days; the extract by infusing twice with boiling water, and concentrating the resulting liquors. One kilo of the drug yielded 195 grams of aqueous extract, which preparation he considers preferable to the tincture. The drug contains a glucoside, "orthosiphonin," which is sparingly soluble in alcohol.—Pharm. Jour. and Trans., Dec. 3, 1887, 460; from Rep. de Phar., 1887, 525.

BORAGINACEÆ.

Eriodictyon Glutinosum.—Preparation and character of an acid constituent, *Eriodictyonic Acid*, which see under "Organic Chemistry."

Yerba Santa—Proximate Examination.—Mr. R. S. Dupont has subjected yerba santa leaves to proximate examination. They contained 6.73 per cent. of moisture, and yielded 8.10 per cent. of ash, 35.63 per cent. of which, consisting of chloride and sulphate of potassium, was soluble in water. The insoluble portion consisted of calcium phosphate, traces of iron, silicate of potassium, and sand. Two resins were extracted, one by chloroform, which is green, soluble in potassium hydrate and ammonium hydrate, from which solution it is precipitated, by alcohol in a condition in which it is readily soluble in water; the other, extracted by alcohol, is brown, and insoluble in chloroform. Pectin, or pectic acid, is also present in the drug.—Phar., Era, Nov. 1887, 403–404; from Proc. Mich. Phar. Assoc., 1887.

CONVOLVULACEÆ.

Jalap—Commercial Quality.—In his paper, giving the details of an improved method for the assay of jalap (which see), Dr. Squibb also gives the results of the examination of ten commercial samples of jalap by the method, as follows:

Sample Number.	Loss by drying at 100° C per cent.	Total dry extract by difference per cent.	Moist soft resin per cent.	Dry resin on filter per cent.	Ether soluble resin per cent.	Active resin per cent.	Total resin per cent.
1	8.20	14.80	10.84	.05	.89	6.38	7.32
2	8.49	16.23	16.00	.14	.74	8.22	9.10
3	8.00	14.40	13.64	.06	.86	7.80	8.72
4	8.43	19.56	......	.13	1.19	6.50	7.82
5	8.42	20.28	......	.06	.95	5.50	6.51
6	......	......	......	.33	.45	8.00	8.79
7	8.40	13.62	......	.04	.80	5.34	6.19
8	6.30	31.38	31.56	.18	1.24	17,08	18.50
9	10.00	20.96	......	.09	.71	7.60	8.40
10	9.40	19.92	......	.09	.40	6.24	6.73

Of the above samples seven were from the best wholesale drug houses in New York, and No. 9 and 10 are from the London market and represent two lots of the best Mexican jalap to be found there. The author's experience during late years with jalap for making the extract and resin is shown in the following:

In 1879 a lot of	125	pounds	of powdered jalap	gave about	17	per cent. resin.	
" 1882 "	220	"	"	"	13.4	"	
" 1883 "	107	"	"	"	7.6	"	
" 1885 "	100	"	"	"	7.9	"	
" 1888 "	250	"	"	"	15.6	"	

He believes that at the present time there is not a bale of jalap in the

New York market in wholesale hands that will yield 12 per cent. of officinal resin.—Ephemeris, June, 1888, 1100–1101.

Jalap—Improved Method of Assay.—Dr. E. R. Squibb gives a detailed description of his process of assay of jalap, which is an improved modification of the officinal method. It may be briefly stated as follows: 10 grams of finely powdered jalap are dried at 100° C. for four hours on a watch glass, and cooled under a bell glass before weighing. 250 grams of the same sample of jalap are shaken with 75 c.c. of alcohol, heated to boiling, and digested with frequent shaking in a warm place for 24 hours. The contents of the flask are then transferred to a tared double filter, the tincture is filtered off, and alcohol dropped on until 100 c.c. have percolated. The contents of the inner filter are then removed, boiled with 25 c.c. of alcohol, shaken, and returned to the filter, which is washed with alcohol as before to 100 c.c.; the two portions of filtrate being evaporated to a thin extract, whilst the filters and residue are dried at 100° C., and the weight of the latter ascertained, using the outer filter as counterpoise for the inner. The thin extract is diluted with 10 c.c. of alcohol, stirred, 10 c.c. of water are added, the mixture is again stirred, and warmed until a smooth mixture is obtained; but if this is transparent, water must be added to turbidity. It is now poured together with the alcohol rinsings into the original flask containing 125 c.c. of water, and shaken until the precipitated resins adhere to the bottom and sides of the flask. The liquid is decanted, and as a precautionary measure, passed through a tared double filter, as are also the aqueous washings. To approximately determine the ether-soluble resin, the adhering resin in the flask is washed out by three successive portions of 10 c.c. of ether, and the united ether solutions are dried at 100° C., and weighed. The remaining resin is dissolved by repeated portions of 10 c.c. of alcohol, observing to wash the cork (and double filters?—Rep.), and the united alcoholic solutions are evaporated, the resin is melted over a lamp, cooled, and weighed.—Ephemeris, June 1888, 1095–1100.

East Indian Jalap—Examination.—Mr. C. J. H. Warden has subjected some jalap tubers grown at Mussoorie, N. W. P., India, to examination. The six tubers supplied weighed when carefully cleaned, in the fresh state, 47, 82, 121, 163, 210 and 1035 grams respectively; contained on an average 61.77 per cent. of moisture; yielded 4.589 to 5.482 per cent. of ash, of which 67.35 per cent. was soluble in water, 10.756 to 15.367 per cent. of alcoholic extract, and 6.4 to 10.7 per cent. of resin, of which 10.219 to 15.183 was jalapin. The author's results appear to show that there is no definite ratio between size of tubers and amount of extract and resin present.—Pharm. Jour. and Trans., Aug. 13, 1887, 129–130.

Fabiana Imbricata—Non-Alkaloidal Characters of Active Constitu-

ent.—Messrs. Nivière and Liotard have subjected the herbaceous stalks of *Fabiana imbricata* to chemical examination, but have been unable to find any trace of the alkaloid for which the name "fabianine" has been proposed. They are inclined to attribute any therapeutic activity the drug may possess to a fluorescent glucosidal principle resembling æsculin.—Pharm. Jour. and Trans., Dec. 3, 1887, 460; from Jour. de Pharm. et de Chim., Nov. 1887, 389.

Pharbitis Triloba, Meig.—*A Convolvulin-like Resin in the Fruit.*—Dr. R. Schützer has examined the fruits of the Japanese plant, used as a substitute for jalapa, and has isolated a resinous body, which possesses all the characters of *convolvulin*, from jalap root. An amorphous alkaloidal body was also separated.—Pharm. Post, Jan. 22, 1888, 50; from Pharm. Centralh., xxviii., 270.

GENTIANACEÆ.

Gentian Root—Presence of Tannin.—Mr. C. J. S. Thompson records some experiments which convince him that tannin is present in some form in gentian root, in small quantities and in combination with the coloring matter. The results upon which he bases his opinion were obtained with twelve different samples of gentian. In suitably prepared extraction he not alone obtained black color reactions with ferric chloride, but also precipitates with gelatine solution.—Pharm. Jour. and Trans., Dec. 17, 1887, 500.

Gentian Root—Absence of Tannin.—Mr. L. van Itallie has examined various preparations of gentian, such as tinctures and extracts, together with tinctures prepared from authentic specimens of fresh root of *Gentiana lutea*, *G. pannonica* and *G. punctata*, for tannin, but failed to get a reaction for its presence in a single instance, nor could any trace of tannin be found when slices of these roots were subjected to microchemical examination. He incidentally, however, observed the occurrence of an intensely

Fluorescent Body in Gentian Root, which he has obtained in crystalline condition, but not in a sufficiently pure state for identification.—Pharm. Jour. and Trans., Jan. 28, 1888, 623–624; from Nieu. Tijdschr. v. d. Pharm. in Nederl., Dec. 1887. 353.

APOCYNACEÆ.

Apocynum Cannabinum—Proximate Analysis of the Root.—Mr. Henry A. C. Poppenhusen has subjected the root of *Apocynum cannabinum* to proximate analysis by the method of Dragendorff. The moisture in the air-dry drug—which consisted of the roots with portions of the upper stem—was 9.5 per cent., the ash, containing traces of iron, together with aluminium and potassium, combined with sulphuric and hydrochloric acid, amounted to 11.6 per cent. The drug yielded to ether: a crystallizable resin and a glucoside; to alcohol: tannin, glucose, glucoside, and a bitter principle; to water: mucilage, albuminoids, and organic acids; to dilute alkali: mucilage, albuminoids, and phlobaphene; to dilute acid: pararabin. Starch was recognized micro-chemically. The roots proper consist of 62.25 per cent. of bark, which is easily reduced to powder, while the remaining woody portion becomes spongy and very resistant. The taste of the latter portion is almost free from bitterness, while the bark has a persistently bitter taste. An alkaloidal constituent was not found.—Amer. Jour. Pharm., April 1888, 168–170.

Strychnos Ignatii—Botanical Description of the Plant.—Messrs. F. A. Flückiger and Ed. Schär communicate a review of the history of *Strychnos Ignatii.* The plant has not yet been sufficiently described, for the reason that sufficient material has not yet reached Europe, and the authors therefore reproduce an excellent description of the plant by D. Sabastian Vidal y Soler, given in an appendix to the Flora of the Philippines, printed in Manila under the auspices of the Spanish Colonial Minister. The paper is accompanied by an excellent plate illustrating the different organs of the plant.—Arch. d. Pharm., Sept. 1887, 765–773.

"Hippo" aud "Vakamba"—Two African Arrow Poisons.—Mr. Laborde gives an account of two arrow poisons used by certain tribes in Africa. One of these poisons, "hippo," used by the Sakayes and Somangs, causes vomiting, then tetanic convulsions, and a simultaneous arrest of the respiration and cardiac action, followed by death. The other, "vakamba," produces similar effects; but its tetanic action is always less violent, though it seems to cause muscular contraction more rapidly than the hippo. It is mentioned as a curious coincidence that the name "ipoh" is applied by the Malays to *Strychnos Tieute*, the arrow poison of Java.—Pharm. Journ. and Trans., July 30, 1887, 91; from Arch. de Pharm., 1887, 324.

Strophanthus—Locality of Growth, Collection, etc.—In a consular report by Mr. Hawes on the trade of the Ayassa Territories, some interesting information regarding strophanthus (kombe) is given by Mr. J. Buchanan, of Zomba, who originally introduced the plant to Professor Frazer. During the last year over 1100 pounds of the fruits were exported from these districts. The plant is found at a low level, and, as far as could be gathered from personal observation and native sources, is not to be had on high land. The supplies hitherto obtained have been drawn from the right bank of the river Shire below the Murchison Rapids. There is apparently more than one species, or, at least, variety; the distinguishing features being a much smaller pod and fewer seeds. At present, information relative to these other varieties is scant. The strophanthus is a strong climbing plant, and is always found in the vicinity of high trees, on which it supports itself. The stem varies in diameter, but has an average of a few inches. It lies on the ground in folds, the branches supporting themselves on the nearest trees. The young branches have a rod-like habit, and are in appearance not unlike elder. The fruit grows in pairs, and has a peculiar appearance, very like a pair of immense horns hanging to a slender twig. The fruit begins to ripen in July and lasts till the end of September. Judging from the few plants reared by Mr. Buchanan, it would appear to be a strong growing plant, but the natives are quite ignorant of its age, or how old a plant may be before it bears fruit. Respecting the preparation of the

Arrow Poison, the native method is very simple. The seeds being cleaned from the hairy appendage, are pounded to a pulp, a little water being added, together with the bark of a tree containing a gummy substance, which helps to keep the poison on the arrow, in event of its striking a bone. The poison thus prepared is spread upon the arrows and allowed to dry; game wounded by arrows poisoned with strophanthus, dies quickly. Pharm. Jour. and Trans., March 3, 1888, 748.

Strophanthus Hispidus—Chemistry.—Since his former communication on the chemistry of *Strophanthus hispidus* (see Proceedings 1887, 123), Professor Frazer has completed a systematic examination of various parts of the plant, more particularly the seeds. The active principle occurs most abundantly in the seeds. The body obtained by treating the alcoholic extract with ether, as described some years ago, possesses great pharmacological activity, and has the characteristics of a glucoside. In some subsequent experiments, however, although the same process was followed, a well-marked crystalline product was not always obtained, and it soon became evident that the difference was due to some variation in the seeds operated on. It was also found that the body obtained by the process formerly described, whether in well-defined crystals or not, was resolvable by acetate of lead into at least two bodies, one of which is an extremely active glucoside, and the other an acid for which the author suggests the name of

Kombic Acid. It being apparent, therefore, that the strophanthin first described is not a simple substance, attempts were made to improve the process so as to separate the strophanthin in a pure state. The author gives the process by which he succeeded to obtain pure

Strophanthin, which he describes as follows: It is imperfectly crystallized, neutral in reaction, intensely bitter, freely soluble in water, less in rectified spirit, and nearly insoluble in ether and chloroform. Its ultimate composition fairly corresponds with the formula $C_{20}H_{34}O_{10}$. It is a glucoside, being with extreme ease resolved by mineral acids and many of the organic acids into glucose and a crystallizable body, which the author calls

Strophanthidin. The action of acids renders it apparent that an acid, and especially a mineral acid, should not be used in the preparation of strophanthin; and it is owing to the use of hydrochloric acid in the extraction of strophanthin that Hardy and Gallois (Jour. de Pharm., xxv. 177) failed to obtain a glucoside, their crystalline principle evidently being the decomposition product, strophanthidin.—Pharm. Jour. and Trans., July 23, 1887, 69.

Strophanthus—Constituents, etc.—Mr. W. Elborne, in continuation of a former paper (see Proceedings 1887, 122), reports some experiments upon a fine sample of the greenish brown variety of strophanthus seed, known in commerce as *S. Kombé.* It contained 7 per cent. of moisture, and yielded 20.8 per cent. of fixed oil, calculated for the dry seed, to petroleum ether. The oil contained none of the glucoside, and was free from bitterness. The brownish-green portion of the oil is derived from the testa of the seed, the oil from the nucleus of the seed being pale yellow. The seed thus freed from moisture and oil, yielded to alcohol 3.23 per cent. of extract, calculated for the original seed. The author enumerates the following objections to the process devised by Gerrard (see Proceedings 1887, 355); 1. The alcohol fails to extract all the strophanthin. 2. The tannin precipitate is more or less soluble. 3. The glucoside is liable to be decomposed by the evaporation of the alcoholic solution containing the liberated acetic acid. The author finds preliminary maceration with very weak alcohol, followed by the addition of absolute alcohol, to be the best for extracting the strophanthin, and has devised processes for preparing strophanthin (which see under "Organic Chemistry") and tincture of strophanthus (which see under "Pharmacy"), in which the seed is so treated.—Year-Book of Pharmacy, 1887, 421–427.

Strophanthus—Composition of Kombé Seeds, etc.—Mr. Catillon finds the seeds of *Strophanthus Kombé* to contain in 100 parts:

Fatty matter, soluble in ether and alcohol,	32.
Dry extract, soluble in alcohol of 70 per cent.,	15.
Gummy and albuminous substance,	11.
Insoluble residue,	34.
Water and loss,	8.

The fatty matter is of an intense green color, and imparts this tint to the tincture if the seeds themselves are treated with strong alcohol. It must be eliminated both from the extract and tincture because of its repulsive odor and liability to produce nausea. By extracting the seeds (deprived of the fat) with 70 per cent. alcohol, a yellow tincture is obtained, free from gummy and albuminous substances; but the author considers the dry

Extract of Strophanthus, obtained by evaporating this tincture, to be preferable, since the tincture is liable to vary in the amount of extract it contains, and has a bitter taste. The dry extract may be given in doses of 0.001 gm. (=$\frac{1}{64}$ grain), best in form of granules, twice daily. The author also has prepared, and describes *strophanthin*, which see under "Organic Chemistry."—Amer. Drugg., May 1888, 83; from Arch. de Pharm., 1888.

Strophanthus Seeds—Commercial Character.—Mr. Catillon states that a package of strophanthus seeds recently received by him from the Niger contained several varieties, and that these were usually sold together under the name of *S. hispidus.* The mixed seeds contained 7½ per cent. of amorphous strophanthin, a yellow oil, and 13 per cent. of extractive. The epicarp contained only a very minute quantity of strophanthin. An insect and its larva lived in the interior of the seeds without apparent inconvenience.—Amer. Jour. Pharm., May 1888, 237; from Prog. Méd., March 31, 1888.

Strophanthus Seeds—Varieties of the Market.—Aside from several sorts of strophanthus seeds, which have a purely botanic interest, Mr. Blondel finds that the four principal species of strophanthus seeds now in the market consist of: 1. Strophanthus of the Niger, which most resembles the *S. hispidus* of the museums, though it sensibly differs from it in the form of the seed and the length and the abundance of the hairs. 2. Kombé strophanthus, which has longer hairs, and seed of a green instead of a brown color. 3. The Gaboon strophanthus, whose seeds are brown, thin, and perfectly smooth. 4. The Zambesi strophanthus, whose seeds are of a greenish-gray color, thickly covered with long, soft, and shining hairs. The two first are less plentiful in the market than the others, and the third is still somewhat rare. This one—from the Gaboon—appears to be remarkably active. This is the sort used by Polaillon and Carville for their first researches, and later by Hardy and Gallois for the extraction of strophanthin. It is, therefore, the seed which physiologists have thus far called—though wrongfully—Strophanthus hispidus, *De Cand.* The fourth, the woolly seed of Zambesi, though rare in France, appears to have been much used in England, where it enters wholly or in part into the preparation of Fraser's tincture.—Amer. Jour. Pharm., April 1888, 179; from Jour. de Pharm. et de Chim., March 1, 1888.

Strophanthus—Variable Physiological Activity of Different Species.—At a meeting of the *Societé de Phar.* (Nov. 2, 1887), several members presented observations upon the therapeutic uses of the plant. It was found that the different species were very variable as to physiological activity, some of them being almost valueless.—Amer. Jour. Phar., Jan. 1888, 12.

Strophanthus—Value as a Heart Tonic.—Dr. Fraenkel reports the results of a series of trials of strophanthus, and says that as a heart tonic it is efficient, but can in no sense approach digitalis, except in individual cases where, owing to some peculiar condition, it acts more favorably. It acts best in functional disorders, such as are caused by alcohol or tobacco, and also in the relief of ascites caused by engorgement of the portal circulation.—Amer. Drugg., June 1888, 111; from D. Med. Wochenschrift.

Quebracho—Toxic Characters of the Alkaloids.—Recent studies by Dr. Huchard confirm the belief that quebracho is chiefly of value in dyspnœa. He finds that all of the alkaloids are toxic, the most poisonous being quebrachine and hypoquebrachine, which cause convulsions and rapid death. Aspidospermine is the least toxic and the most useful in dyspnœa. He finds that some of the aspidospermine of commerce is but a mixture of all the quebracho alkaloids, which Hesse (1882) designated as follows: quebrachine, hypoquebrachine, quebrachamine, aspidospermatine and aspidosamine; the bark contains also quebrachol.—Le Monde Pharm., Jan. 20, 1888; Amer. Jour. Pharm., March 1888, 140.

Wrightia Antidysenterica—Character of the Alkaloid from the Seeds.—*Wrightine* (*Conesine*), which see under "Organic Chemistry."

Condurango Bark—Commercial Varieties.—Dr. Frederick Hoffmann calls attention to the renewed interest manifested by physicians in condurango bark, and the consequent desirability of further investigations in the direction of its proximate constituents. The bark is known to contain small quantities of a glucoside and large quantities of resin, either or both of which may prove to be the active constituents. The researches in this direction become more difficult, however, owing to the fact that several varieties of condurango are found in the market. The bark introduced from Ecuador in 1871 and 1872 was derived from *Gonolobus Condurango*, Triana, or *Marsdenia Condurango*, Reichenbach. According to a communication to "Chemiker Zeitung" (1888, Nos. 2 and 24), commercial condurango is derived from three sources, viz:

1. *Genuine Condurango*, obtained from Ecuador, and derived from *Gonolobus Condurango*, Triana. In 1872 this drug was composed of the branches covered with bark. The present drug is composed of the bark exclusively, which is known more particularly as Condurango Mataperro.

2. *Guayaquil Condurango.*—This drug is composed of pieces of the bark and of fragments of the woody branches of the plant, with bark adhering, having the thickness of 0.4 to 1.3 cm. It is evidently derived from an asclepiadaceous plant, very nearly related to the genus *Gonolobus*, but its precise source is not known. While the distinctions between Ecuador and Guayaquil condurango are quite marked, there is nevertheless a sufficient resemblance in the structure of the two barks to justify the conclusion that the two drugs are nearly related.

3. *Mexican Condurango.*—This is composed of the cut and split stems of a plant belonging to the genus *Aristolochia.* The stems are provided with a thin bark, thin wood, and large pith. Externally, the pieces vary between green and brown. The drug is odorless and tasteless, and it may safely be assumed that it has nothing else in common with condurango than the name. The structure of these varieties of commercial condurango is fully described and illustrated by numerous cuts, which see in Pharm. Rundschau, May 1888, 104–107.

Ophioxylum Serpentinum—Proximate Constituents of the Root.—Professor Bellink has obtained from the root of this Indian apocynaceous plant, at one time erroneously supposed to be the source of coptis root, besides resin and volatile oil, a crystalline compound, which he has named

Ophioxylin. It has the composition represented by the formula $C_{16}H_{13}O_6$ or $C_{48}H_{39}O_{18}$; occurs in orange-yellow crystals of the tetragonal system, having an acrid, burning taste, with difficulty soluble in water, better in alcohol, and freely in chloroform, benzol and bisulphide of carbon. It is stated to resemble juglon in its properties, but melts at a much lower temperature, viz., 71.8° C.—Pharm. Jour. and Trans., March 3, 1888, 744; from Nieuw. Tijdsch. Pharm. Neder., Jan. 1888, 1.

SAPOTACEÆ.

Gutta Percha—Examination of Different Sorts.—Messrs. Heckel and Schlagdenhauffen have examined the gutta percha obtained from the Abyssinian trees, *Mimusops Schimperi* and *M. Kummel,* Hochot, and find that it contains 48.20 per cent. of gutta, 42.80 per cent. of an amorphous resin, produced apparently by the oxidation of albane, and 9.80 per cent. of inorganic salts. The crude article is elastic and adhesive, the latter character being due to the resin. The authors also examined the product of a species of *Payena* from the Sunda Islands, which yielded about 30 per cent. of caoutchouc, and a crystalline and an amorphous resin. The authors do not regard either of these products available for technical purposes in their pure state, but that they may be useful for mixing with other varieties of gutta percha.—Pharm. Jour. and Trans., June 30, 1888, 1089; from Compt. Rend. cvi., 1625.

Bassia Oleracea (?)—*Analysis of the Flowers.*—Bassia flowers, which are used in India for the preparation of an alcoholic beverage, have been analyzed by Messrs. Klinger and Bujard, who have also made some fermentation experiments with them. They contained 16.93 per cent. of water and 83.07 dry substance, the mineral components in the latter amounting to 2.91 per cent. They yielded 89.1 per cent. of extract (to water ? Rep.), containing 58.32 per cent. of sugar, 1.70 per cent. of tartaric acid, and 1.80 per cent. of mineral substance. 100 c.c. of the fermented juice (Bassia-wine) contained 3.28 grams of alcohol, 1.698 grams of extract, 0.213 mineral substance, and 0.615 gram of tartaric acid.

The odor and taste are not such as to make the fermented liquor a desirable beverage.—Pharm. Post, Jan. 22, 1888, 49; from Report. d. Anal. Chem., 1887, 411.

Lucuma—Useful Brazilian Species.—Dr. Theo. Peckolt communicates a description of a number of Brazilian species of *Lucuma*, representing those that are used in one way and another by the inhabitants of Brazil. The species described are the following:

Lucuma Bonplandii, H. B. Kth.—The fruit is juicy, has a very pleasant taste, and contains from 1 to 5 large seeds, which are said to contain amygdalin.

Lucuma litoralis, Mart.—The fruit, which has an unpleasant astringent and sweetish taste, has the reputation of a remedy in chronic diarrhœa.

Lucuma mammosa, Gaert.—The fruit is eaten as dessert, a little lemon juice being added to correct its insipidity. The seeds, which contain according to Saever 25 per cent. of a bland, pleasantly odorous fixed oil, are used in kidney complaints. The bitter bark is used against intermittent fever; a tincture 1:5, being given in teaspoonful doses; an alcoholic extract in 0.1 to 0.2 gm. doses when fever is absent.

Lucuma marginata, Mart. et Eichl.—The fruit has an unpleasant sweetish taste, but is very popular with the Indians.

Lucuma obovata, H. B. Kth.—The fruit has a very pleasant creamy taste. The seeds are roasted and used for a beverage. The decoction and emulsion of the raw seeds is used in the treatment of catarrh of the bladder.

Lucuma Rivicoa, Gärtn.—The fruit has a mucilaginous, agreeable, sweetish pulp, and constitutes a popular dessert. It is used medicinally in the form of confection and syrup, in the treatment of dysentery and catarrh of the lungs. The emulsion of the seeds is a popular diuretic.

Lucuma procera, Mart.—The pulp of the fruit has an acrid taste; but the acridity is destroyed by heat, and the fruit, either boiled or roasted, constitutes an agreeable food.

Lucuma procera, Mart., var. *cuspidata*, Mart. et Eichl.—The fruit has a very pleasant-tasting sweet pulp, and is quite popular. The bark abounds in latex, which may be useful as a source of gutta percha, the following being its composition:

Gutta percha-like substance	182.600
Massarandulin (cryst. resin)	82.790
White resin	16.340
Albuminoids	8.590
Sugar	6.310
Pectin-substance, malic acid, dextrin, etc.	103.020
Inorganic salts	21.660
Water	578.690

The bark is used as a mild astringent, and, as powder mixed in the mandioca-meal, as poultice for boils.

Lucuma torta, Mart.—A syrup is made from the edible fruit, which is used in bronchial catarrh and lung troubles.

Lucuma chrysophylloides, A. D. C.—This tree yields an abundance of latex, and might be useful for the production of gutta percha. The pulp of the fruit is pleasant and sweet.

Lucuma Gardneriana, A. D. C.—The fruit is faintly sweet, and rich in latex.

Lucuma psammophila, A. D. C.—The agreeable, sweet fruit is considered a delicacy, and is used in the preparation of a confection. The bark has the reputation of a tonic.

Lucuma Caimito, A. D. C.—The large fruit has a yellowish-white, firm pulp, having a taste resembling that of good pears. The seeds are large and bitter. Subjected to proximate examination, the fruits gave the following results:

The Rind:

Orange-yellow soft resin	1.312
Saccharin extractive	1.614
Albumen, extract, cellular tissue	13.525
Water	83.549

The Pulp:

Caoutchouc	0.021
Orange-yellow soft resin	0.962
Tannic acid (iron-greening)	0.017
Sugar	10.200
Albuminoids, pectin, dextrin, etc.	3.600
Inorganic salts	0.200
Water	85.000

The Seed:

Fixed oil	56.250
Resin	31.875
Extractive	38.741
Sugar	24.375
Lucumin (bitter principle)	65.000
Albuminoids, mucilage, extractive, etc.	177.496
Cellulose	106.263
Water	500.000

The bitter principle which the author has named

Lucumin, constitutes a pale yellow powder, which has a strong bitter and persistent taste, followed by an acrid impression in the fauces. It is completely combustible; insoluble in chloroform or ether; soluble in water, alcohol or acetic acid. The author has used it as a tonic, against diarrhœa, and as a febrifuge, the dose being for these respective purposes

0.05 to 0.10, 0.15, and 0.20 to 0.50 gram. The fresh seeds as well as the bitter bark are popularly used as remedial agents.

Lucuma laurifolia, A. D. C.—This tree yields an abundant latex. The fruit has a pleasant apple-odor and mucilaginous sweet taste.

Lucuma lasiocarpa, A. D. C.—The fruit is acrid and edible only after roasting it in ashes.

Lucuma glycophlæa, Mart. et Eichl.—This tree is perhaps the most important from a pharmaceutical point of view, since it is the source of the commercial extract, introduced from Brazil under the name of

Monesia. The bark was introduced into Europe as early as 1555, and is the part now principally exported. It was analyzed in 1839 by von Heidenreich, and then by Derosne and O. Henry. Dr. Peckolt has subjected the fresh

Monesia Bark to proximate examination, and obtained the following results, those of Derosne and Henry being given alongside for comparison:

	Peckolt. (Fresh bark.)	Derosne and Henry (Air-dry bark.)
Wax	5.690	12.000
Fat	——	
Chlorophyl	——	
Yellow soft resin	0.172	
Acid resin	0.825	
Tannic acid	61.587	75.000
Gallic acid	6.960	
Red coloring matter	22.000	92.000
Glycyrrhizin	15.000	14.000
Monesin	2.805	47.000
Hivurahein (crystallized)	0.089	
Bitter principle	1.138	
Albuminoids	12.000	
Starch	19.670	
Malate of calcium	1.400	13.000
Ash	101.790	30.000
Mucilage, dextrin, etc.	63.720	717.000
Cellulose	526.634	
Water	164.210	

Dr. Peckolt has succeeded in isolating the

Monesin in a pure crystalline condition. These crystals are soluble in ether, and they are associated with an amorphous body, insoluble in ether, but soluble in ether-alcohol or alcohol, which he believes to be identical with the "monesin" of Henry. The crystals of monesin are, furthermore, colored by a greenish fluorescent substance, which is removed by washing with cold alcohol. The alcoholic solution yields this new substance, which the author has named

Hivurahein (after the oldest name of the plant). It forms fine, silky-glistening needles, which have a bitter taste, are insoluble in water, sparingly in cold alcohol, and readily soluble in hot alcohol and in ether.

The plum-like fruit of this species of Lucuma is valued highly on account of its pleasant taste, and it, as well as the sweet bark, have been long used by the natives both as food and medicine. Dr. Peckolt has analyzed the fruit and seed, with the following results:

	Seed.	*Fruit Pulp.*
Starch	23.615	1.208
Yellow fixed oil	2.774	——
Yellow soft resin	——	0.842
Fruit sugar	5.434	2.272
Albuminoids	3.644	1.670
Tannic acid (iron-greening)	2.000	1.684
Mucilage, pectin bodies,	——	9.230
Dextrin, etc., etc.	9.417	——
Cellulose	15.923	16.420
Moisture	37.193	66.674

Lucuma laterifolia, Benth.—The fruit is very agreeable, and is used for a celebrated confection, known by the name of "doce de cubio," which is exported to Europe.

Lucuma Sellowii, A. D. C.

Lucuma neriifolia, Hook. et Arn., and

Lucuma montana, Allen, are described, but do not appear to possess remarkable value. The final species described by the author, is

Lucuma pomifera ?—The fruit is remarkable for containing free hydrocyanic acid in considerable proportion, the following being the result of an analysis of the pulp and the seeds:

	Fruit pulp.	Seed.
Caoutchouc	0.017	
Yellow soft resin	0.701	
Fixed oil		22.854
Free hydrocyanic acid (anhydrous)	0.007	
Albuminoids	1.142	4.782
Bitter extractive		2.526
Fruit sugar	12.028	——
Organic acid, extract, etc.	9.443	4.612
Cellulose		35.922
Water	78.946	29.304

—Pharm. Rundschau, Jan. and Feb. 1888, 5–9 and 30–33.

MYRSINEÆ.

Embelia Ribes—Value of the Fruit in Tapeworm.—Dr. Harris, of Simla, directs attention to the value of the fruit of *Embelia Ribes* in tapeworm. He has used it with good results for the last four or five years, both for natives and for Europeans. The dose of the powdered fruits is one to four drachms given with milk and curds early in the morning. The fruits are about the size of small peppercorns and are very aromatic. The author thinks that they deserve further examination.—Pharm. Jour. and Trans., Aug. 27, 1887, 171; from Lancet, July 23, 1887, 199.

Embelia Ribes—Acid Constituent.—Mr. C. J. H. Warden, at the request of Dr. Harris, endeavored to isolate the principle to which the anthelmintic properties of the fruit of *Embelia ribes* is due. While he is not prepared to affirm its active character, which will be subject of further experiments, he has isolated an acid, which he has provisionally named

Embelic Acid.—The new acid forms crystalline compounds with soda, with potassa, and with ammonia.—Pharm. Jour. and Trans., Jan. 21, 1888, 601.

STYRACEÆ.

Benzoin—Use of the Powder for Insufflations in Whooping Cough.—Some practitioners, convinced of the microbian nature of whooping-cough, are using intra-nasal insufflations of antiseptic powders for it. Michael (of Hamburg) recommends powdered benzoin once a day. Moizard uses a powder composed of benzoin and salicylate of bismuth of each 5 gm., and sulphate of quinine 1 gm., three or four times daily. Each naris must be insufflated. A rubber tube is used; the powder is introduced into one end, which is fixed in the naris; the other end is placed in the mouth, and the powder blown to its place.—Amer. Jour. Pharm., Aug. 1887, 401; from Arch. de Phar., July 1887.

ERICACEÆ.

Uva Ursi—Anatomical Structure.—In his work on the anatomy of officinal leaves and herbs, Mr. A. Meyer states that he was unable to detect the "one celled, thin-walled hairs" on the leaves of *Arctostaphylos Uva ursi*, Sprengel, mentioned by Wiegand, and that leaves from very different sources, and at various stages, were examined without affirmative results. Even scars left by the falling off of hairs are said to be wanting. Vogl, in his "Anat. Atlas zur Pharmacognosie" (1887), also fails to mention or figure any hair. Mr. Joseph Schrenk has investigated the subject, and is unable to account for the difference in the results arrived at by such accurate observers as the authorities mentioned and those which he has himself obtained. Leaves of uva ursi collected by him in different localities, as well as those of the commercial drug, were found to possess abundant hairs on and near the margin, and along the midrib and its principal branches. The younger leaves, of course, and those from herbarium specimens, exhibited the hairs in greater profusion than the old ones or those of commerce; but even in the latter cases, their former abundant occurrence could be safely inferred from the scars they left. These hairs are not one-celled, however, but consist invariably of two cells.

The lower is of varying length, sometimes quite short, but sometimes one-third the length of the entire hair. It has very thick, cuticularized walls, and is jointed to the long, thin-walled and tapering upper cell; this easily breaks off, so that, after much handling, only the lower cells remain, which are wedged in between the strongly cuticularized walls of the epidermis cells. The hairs are either straight or curved, or undulating in various ways.—Amer. Drug., June 1888, 102.

COMPOSITÆ.

Grindelia Robusta—Proximate Analysis.—Mr. John L. Fischer has subjected *Grindelia robusta* to proximate analysis, and gives the results as follows:

Moisture		11.08
Fixed oil Chlorophyll	Petroleum extract	8.50
Oleo-resin Chlorophyll The acid. The alkaloid.	Ether extract	10.05
The acid The alkaloid Oleo-resin Chlorophyll Extractive matter	Alcohol extract	6.00
Extractive matter Pectin Sugar The alkaloid The acid.	Water extract	13.05
Extractive matter Salts	Dilute acid solution	2.02
Cellulose		47

The most important constituents determined by the author are an acid and an alkaloid. The acid, which the author calls

Robustic acid, is crystallizable, soluble in water, alcohol and ether, insoluble in petroleum spirit and chloroform. For the alkaloid the author proposes the name

Grindeline.—He gives a process for its preparation in a pure condition, and describes it as being bitter, soluble in ether, alcohol and water, and precipitable by the principal alkaloid-reagents. It neutralizes acids and forms a crystalline sulphate.—Pharm. Era, June 1888, 208; from Med. Herald, March, 1888.

Grindelia—Proximate Examination.—Mr. G. Lingwood Libby has made some experiments with a view to determine some of the proximate constituents of grindelia. An *oleo-resin* was obtained by extraction with ether, which was dark green, readily soluble in solution of potassa, and had the characteristic odor and taste of the drug. A *resin*, prepared by extracting the drug with absolute alcohol and precipitating the tincture in water, was solid at the ordinary temperature, but became soft by the warmth of the hand. It was partly soluble in benzine and in chloroform. The leaves yielded 5.5 per cent. of ash. The largest proportion of extractive was obtained by the menstruum prescribed by the U. S. Pharmacopœia (for fluid extract? Rep).—Pharm. Era, Jan. 1888, 11.

Eupatorium Perfoliatum—Proximate Analysis of the Leaves.—Mr. F. W. Franz has subjected the leaves of *Eupatorium perfoliatum* to proximate analysis, following Dragendorff's scheme, with the following results:

Ash (potassium, calcium, iron, and silica)	7.5	per cent.		
Moisture			9.40	per cent.
Petroleum spirit extract:				
Volatile oil	0.01	"		
Resin	0.80	"		
Wax. { a portion melting at 95° C. " " 145° C.	2.60	"		
Eupatorin (in small amount)				
Chlorophyll and undetermined resinous substances	——		6.19	"
Ethereal extract:				
Gallic acid	1.50	"		
Resin and some chlorophyll	6.80	"		
	——		8.30	"
Alcoholic extract:				
Tannic acid	5.60	"		
Undetermined substances	3.12	"		
	——		8.72	"
Aqueous extract:				
Mucilage and sugar			20.86	"
Dilute soda extract:				
Albuminoids and mucilage			8.00	"
Lignin			3.82	"
Intercellular substances			21.86	"
Cellulose			9.31	"
Ash (silica)			0.59	"
Loss			2.95	"
			100.00	

The bitter principle is described under the heading of "Eupatorin" (see under "Organic Chemistry"). The *volatile oil*, obtained by distilling the fresh leaves with water, had the odor peculiar to them.—Amer. Jour. Phar., Feb. 1888, 77–79.

Eupatorium Purpureum—Analysis of the Leaves.—Mr. Frank M. Siggins has subjected the leaves of *Eupatorium pupureum* to proximate examination, with the following results:

Ash		4.16
Moisture		5.54
Petroleum ether extract: Volatile oil (.18), wax, resin and chlorophyll,		6.99
Ethereal extract: Bitter principle, resin and chlorophyll		2.90
Alcoholic extract: Bitter principle, resin and chlorophyll		2.14
Aqueous extract: Mucilage	4.80	
Dextrin	4.75	
Sugar	3.80	
		14.20
Dilute soda extract: Albuminoids (720), etc.		16.30
Dilute hydrochloric acid extract: Calcium oxalate (1.80)		6.91
Lignin and cellulose		37.90
Loss		2.96
		100.00

The active principle of this drug is evidently a glucoside of a bitter taste, soluble in ether, alcohol and water, and should be further examined. The other constituents are not materially different from those found in many other plants of this natural order, as seen by the above summary.—Amer. Jour. Pharm., March 1888, 121–122.

Lappa Officinalis—Proximate Analysis of the Root.—Mr. Gustav A. Weckler has subjected burdock root by proximate analysis. He determined, besides 8.21 per cent. of moisture (in the air dry root) and 3.67 per cent. of ash (sodium, potassium and iron salts), the following components:—

Extract by petroleum benzin: fixed oil	.400	.400
Extract by ether: fixed oil	.539	
Wax, soluble in chloroform	.011	.550
Extract by absolute alcohol: extractive sol. in water	2.210	
Phlobaphene sol. in ammonia	.075	
Resins	.965	3.250
Extract by water: mucilage, little albumen	4.000	
Sugar (glucose)	5.000	
Extractive matter	8.400	
Inorganic matter	1.200	18.600
Extract by soda: albuminoids	2.720	
Other organic compounds	.200	2.920
Extract by dilute HCl, mostly organic compounds	4.200	4.200
Inulin, cellulin and lignin		70.080

—Amer. Jour. Pharm., Aug. 1887, 393–394.

Lappa—Chemical Analysis of the Root.—Florence Edith Hendershott has made a proximate analysis of burdock root, with the following results: Moisture, 10.57 per cent.; ash, 5.25 per cent., composed of 37.54

parts soluble in water, 32.30 parts soluble in hydrochloric acid, 28.11 parts soluble in sodium hydrate, and 2.15 parts of sand and clay. The drug contained glucosides, soft resin, fixed oil, extractive, arabin, pectic acid, starch, and coloring matter. The per cent. of solids removed successively by different solvents was as follows:

Chloroform	4.27	per cent.
Alcohol	11.95	"
Water	52.32	"
Acid solution	1.50	"
Alkali solution	8.13	"

Pharm. Era, Feb. 1888, 49; from Proc. Mich. St. Phar. Assoc., 1887.

Burdock Fruit—Character of Bitter Principle.—In a former paper (see Proceedings 1885, 137,) Prof. Henry Trimble, in conjunction with Mr. I. D. McFarland, gave an account of the proximate analysis of burdock fruit, in which it was stated that the bitter principle, then believed to be an alkaloid, would be further investigated. Since then Prof. Trimble has reviewed the work until an entire re-analysis has been completed. The results differ in no important particular from those recorded then, except in the character of the bitter principle. A large quantity of the desired material was prepared by exhausting the drug with petroleum spirit to remove fixed oil, and then with alcohol. On pouring the concentrated alcoholic solution into water the resin separated, but the bitter principle dissolved in the water, from which it was readily removed by agitation with chloroform. The residue on evaporating the chloroform was treated with water, and the clear aqueous solution allowed to evaporate in a desiccator over sulphuric acid, when a white granular crystalline substance separated. This may be further purified by resolution in water and again evaporating in a desiccator. The purified material is pure white, of an intensely bitter taste, and has a neutral reaction. On testing for alkaloids, negative results are gotten. By the action of boiling dilute hydrochloric acid it is split into a resin, which appears to be identical with that obtained on pouring the alcoholic solution into water, and the clear filtrate gives abundant evidence of glucose, showing the bitter principle to be a glucoside. The author hopes soon to investigate its composition and properties more fully.—Amer. Jour. Pharm., Feb. 1888, 79–80.

Tussilago Farfara, Lin.—*Proximate Examination of the Leaves.*—Mr. Charles S. Bondurant has subjected the leaves of *Tussilago Farfara*, carefully freed from the long petioles and other extraneous matter, to proximate examination. The amount of mixture in the air-dry drug was 7.8 per cent. Petroleum spirit extracted 2.18 per cent. of substance, containing acrid volatile oil, waxy and caoutchouc-like matter and resinous matter. Ether extracted from the residue, remaining after treatment with petroleum ether, 2.63 per cent. of solid matter, evidently containing a bitter glucoside, which was obtained in an amorphous condition, and a dark-brown brittle resin, together with a little caoutchouc. From the residue, after extraction with ether, alcohol cxtracted 3.28 per cent. of matter, composed mainly of tannic acid, with probably some gallic acid. Water now extracted 11.22 per cent. of substance, composed mainly of mucilage, dextrin and allied carbohydrates, but notably containing a little saponin. Caustic soda solution extracted 6.21 per cent. of albuminoids. Lignin and incrusting substances amounted to 19.42 per cent.; cellulose, 28.43 per cent. The ash amounted to 17.10 per cent., and contained potassium, calcium, magnesium, iron and aluminium, chlorides, phosphates, carbonates and silicates.—Amer. Jour. Pharm., July 1887, 340–342.

Insect Powder—Addition of Naphthalin.—It is stated in Pharm. Ztsch. f. Russl. (1887, 558), that the addition of 1 per cent. of naphthalin to powdered flowers of *Pyrethrum roseum* renders the insect powder more effectual.

Batiator Root—Botanical Source, Characters and Constituents.—Messrs. Heckel and Schlagdenhauffen have made a series of investigations of batiator root, a drug which has been described as an emetic. They observe that the plant yielding it, also called batjentjor, is widely distributed in West Africa, and is regularly sold in the St. Louis (Senegal) market as a febrifuge. An examination of authentic specimens of the plant has enabled the authors to determine the drug to be the root of

Vernonia Nigritiana, S. and H. The root is composed of numerous fibres 20 to 30 centimeters long, slender and greyish-yellow externally, a number of which are united to form an irregular knotty rhizome, unequally spherical at the neck or crown, and covered at this point with silky hairs. The active constituent is a glucoside, for which the authors propose the name of

Vernonin, ($C_{10}H_{24}O_7$). As obtained it is a hygroscopic whitish powder, forming a pale yellow solution with water, and only slightly soluble in ether and in chloroform. By the absorption of 2 mol. of water, the new glucoside is split into a resinous body and into glucose. Physiological experiments made upon frogs, show vernonin to be a cardiac poison comparable to digitalin, but about eighty times less active.—Pharm. Jour. and Trans., June 30, 1888, 1087; from Rep. d. Pharm., June 1888, 208.

Cineraria Maritima—Value of the Leaves in the treatment of Cataract.—Dr. R. Mercer, in a letter to Mr. J. H. Hart, Superintendent of the Royal Botanic Gardens, Trinidad, calls attention to the value of the leaves of *Cineraria maritima* in removing cataractal blindness. He had been totally blind before its use, and, having nothing to risk, consented to try the juice of the leaves, which had been highly extolled by some friends. He applied it in quantities of two drops three times a day in each eye, observed the first glimmer of light on the fourth day, and now, after two months, is able to discern figures and even faces under favorable light, and can even distinguish the hands and tell the hour on a white-dialed watch with his right eye. In its application to the eye the juice produces no irritability or inflammatory action whatever, beyond a slight burning sense of pain which lasts only a few minutes, accompanied or followed by a profuse lachrymal discharge, tinged with the coloring matter of the liquid used, whilst its therapeutic properties are solvent, stimulating and absorbent. Dr. Mercer, asking Mr. Hart for a supply of juice, the plant being scarce at "Port of Spain," draws attention to the desirability of preparing it from leaves of mature growth, which are more active and useful than younger ones.—Pharm. Jour. and Trans., May 26, 1888, 985.

Jerusalem Artichoke—Occurrence of a Special Ferment converting Inulin into Sugar.—See *Inulin Ferment*, under "Albuminoids."

RUBIACEÆ.

Cinchona—Cultivation in Madras.—In continuation of his former paper (see Proceedings, 1887, 135), Mr. David Hooper gives an account of his quinological experiments since then on the Government Cinchona Plantation of the Nilgiris. The report includes the testing of a number of crown barks in order to show the variation in alkaloidal strength of individual trees growing together under the same conditions, the effects of the stripping process in different months of the year, and the value of the bark obtained from trees when treated with different manures. The amount of lime in a full-grown tree is given. Further attention is paid to the renewal of Ledger barks, and analyses of some of the rarer species are tabulated. The following is a brief resumé of results:

Twelve trees of *Cinchona officinalis* of the same age and growing in the same situation were selected indiscriminately. The amount of quinine in them varies from 1.75 per cent. to 3.90 per cent.; the amount of quinidine, from an entire absence to 0.16 per cent. Bark was taken from them the same date every month during a year beginning in May. There was a decrease of alkaloid during the first six months, while in the remaining six months there was an increase, the renewal of bark having well set in with the first month (November) of the second series, the bark proving richer at the end of twelve months than ever before. A plot of cinchona trees having been divided as near as possible into five equal parts, one was unmanured, the others were manured with bone manure, cattle manure, lime and stable manure, and stable manure alone, and the increase, if any, of alkaloid ascertained. The increase in each instance was not very great, amounting only to 14.58 per cent. of quinine between the unmanured and the highest in the table (2.88 and 3.30 per cent.) The amount of lime in a twenty-year old tree of *C. succirubra* weighing (stem bark 21 pounds, root bark 5 pounds, branch and twig 5 pounds, leaves 2 pounds, wood 200 pounds), 233 pounds was (from bark of stem and root 4.74 ounces, bark of branches and twigs 1.04 ounces, leaves 0.44 ounces, wood of stem and root 1.28 ounces), 7.50 ounces, equal to nearly 10 ounces of pure slaked lime. The extent to which renewal of bark can be profitably carried out was shown in the case of a hybrid Ledger cinchona, the maximum being reached in the third year. A fourth year may be borne, but with a decrease in the richness of bark. Mossing is beneficial to the trees from the first six months of their growth to three years; after four or five years, whether "mossed" or "renewed," the alkaloids are not improved.—Yearbook of Pharm., 1887, 559–566.

Cinchona—Cultivation in Bolivia.—Dr. H. H. Rusby, in the course of a lecture delivered at the Philadelphia College of Pharmacy (Dec. 1, 1887) gave an interesting account of the cultivation of cinchona in Bolivia. He stated that at about the time that the plants exported to India had begun to produce seeds, the native supply of South America had become exhausted, and those whose business had thus failed were obliged to invest their capital in the planting and culture of the trees. So it happens that at the present time no bark, except an occasional bale, reaches the market, which is not the product of cultivated trees. A suitable site for the plantation having been selected and prepared, a level loamy spot is selected for the nursery, and here the seeds are planted. When the plants have from three to seven leaves they are transplanted, the varieties being selected with great care. The ground between the rows is kept very clean, the weeding being performed twice annually. The planting is usually done by contract, the contractor agreeing to charge for none but valuable varieties brought to a certain age. The mode of counting the trees is as follows: Commissioners, mutually appointed, walk between the rows of trees, plucking a leaf from each one, which leaves are carried to the house and counted during the evening, those of worthless varieties being rejected, the surface and venation of the leaf constituting the crucial mark. The trees are then carefully attended to until the bark matures. So freely has the pollen been transported from tree to tree, that however fine the tree may be from which you gather your seeds, you will obtain from those seeds trees of almost every variety known to that section; so freely do they hybridize with one another. Similar trees of the same age, growing together, may mature several years apart, the difference of maturity being indicated by the peculiar scaliness of the bark. The markings are very simple and easily recognized. An experienced hand goes through the plantation as a marker, and indicates the trees to be cut. The cutter follows, makes an incision through the bark about three inches above the root, and another one two feet higher, connecting them by a logitudinal incision. The bark is then removed in quills, which reduce very greatly in size and about sixty per cent. in weight, in drying. After this first quill of bark is taken from the tree, it is felled, and similar quills cut from above, tbe smaller portions being shaved. Two or three shoots are allowed to grow from the stump, and when these are cut five or six more may be allowed to grow for the next crop, after which the ground is replanted. The cutting is done by contract, the price paid being from fifteen to thirty-five cents for one hundred pounds of green bark. Arrived at the drying sheds, it is spread upon long narrow stretchers and exposed to the sun. In a week or ten days it is dry, and is tied with strips of raw-hide into bales of from sixty to sixty-five pounds each. This is the shape in which they are transported.

In India the custom prevails of taking bark from one side of the cinchona tree, and then mossing: the "mossing" being practiced to keep out the rays of the sun, and new bark grows under the moss. This bark is not only greater in weight than the bark originally taken from that place, but it is very often much richer in alkaloid. This has been tried in Bolivia, and it has been found to be impossible on account of the great cost, owing to the comparatively high price of labor. The cultivation of cinchona in this region is somewhat easier than in foreign lands. The product is slightly richer, but the expense is much greater than in India, the transportation charges not only eating up all the profits, but actually leaving a deficit on shipments disposed of at forced sale. Cinchona trees were formerly met with two or three times the thickness of a man's body, and tall in proportion. The age of such trees must have been very great, for wild trees at twelve or fifteen years are scarcely as thick as the wrist. Cultivated trees, on the contrary, at six to nine years, are six to eight inches in diameter, and yield from three to six pounds of bark. The bark at present exported from Bolivia is almost wholly the cinchona calisaya, or yellow bark. The pure calisaya bark yields about eight per cent. of total alkaloids. Besides the bark the natives use the leaves and flowers. The leaves are said to be nearly inert, but infusions of the flowers produce excellent results. They also use the buds, from which they make a gelatinous mass and apply it to fresh wounds, which heal up by first intention.—Amer. Jour. Pharm., June 1888, 310–313.

Cinchona—Examination of Barks Cultivated in Bolivia.—Dr. Louis Schäfer communicates the results of his observations (in 1885) respecting the cultivation of cinchonas in the region of the Mapiri river in Bolivia, and gives the results of the assay of a number of barks cultivated there. The most important species that is cultivated is *Cinchona calisaya*, the varieties *calisaya verde* and *calisaya morada* being principally grown. The *Cinchona calisaya* requires a sloping situation, and flourishes best at an altitude of 1500 to 1700 metres, at which altitude the plantations visited by the author are situated. They flower in from 6 to 8 years, attaining a height of 3 to 4 metres, and are cut at this period of their growth, the best time for cutting being just before and at the beginning of the rainy season, October and November. At this period the plant is very juicy, and the bark is very easily removed. The trunk bark is removed in pieces about a ½ metre in length, and these roll up to form quills. The process of "coppicing" is the most popular on these plantations; the trees being cut down close to the ground, the stump will produce several new stems. Very poor results were obtained by the process of "shaving." The recently cut barks have a brownish green appearance on the outer and are yellow on the inner surface. On drying, this appearance is changed to grey-brown on the outer, and yellowish brown on the inner surface. The trees at the age above named yield from 2 to 3 kilograms of dry bark. The following are the results of the assay of cultivated barks from the plantations in different parts of the Mapiri river region:

Air-dry Bark of		Pure Anhydrous Quinine.		Corresponding to Sulph. Quinine containing 7 mol. H_2O.	
C. Calisaya verde		4.20	per cent	5.65	per cent.
C. Calisaya verde morada		3.68	“	4.95	“
C. Calisaya verde (about 12 years old)		5.90	“	7.25	“
C. Lamba verde		4.88	“	6.56	“
C. Lamba morada		3.72	“	5.00	“
C. Uchiculla		3.58	“	4.82	“
C. Pajonal verde		0.50	“	0.67	“
C. Calisaya verde	with Pajonal hybrid.	0.35	“	0.47	“
C. Calisaya verde		0.00	“	—	“
C. Calisaya morada		1.71	“	2.30	“
C. Calisaya morada		3.02	“	4.06	“
C. Cocola morada		0.27	“	0.36	“
C. Cocola verde		0.42	“	0.56	“
C. Cocola verde		2.03	“	2.73	“
C. Cocola with Calisaya morada		1.53	“	2.06	“

An average analysis of the barks of one of the larger plantations was also made, the author cutting small square pieces of bark from a number of trees. The assay of these dried pieces gave 3.70 per cent. of pure quinine, corresponding to 4.98 per cent. of sulphate of quinine.—Arch. d. Pharm., April 1888, 303–307.

Cinchona—Cultivation in Victoria.—Some years ago several species of cinchona plants were raised and distributed by Baron F. von Mueller for test culture in Victoria. Some of these in the estate of Mr. G. W. Robinson, of Berwick, Western Port District, flowered and ripened seed a few years since, and now the bark has been analyzed by Mr. E. Mathews, who gives the percentage of alkaloids as 6.5 per cent. As the Berwick estate is only 100 feet above the sea level, and its distance from Melbourne only thirty miles, it seems evident that some species of cinchona can be successfully cultivated at a much lower level than was hitherto supposed. —Pharm. Jour. and Trans., Aug. 27, 1887, 173; from Gardn. Chron., Aug. 13, 1887, 196.

Cinchona—Commercial Quality.—Dr. C. J. Rademaker reports analyses of five samples of cinchona with the following results: Twenty grams of red bark, labeled No. 1, price $1.50 per pound, yielded 0.5 gram of mixed alkaloids. Twenty grams of red bark, also labeled No. 1, price $1.25 per pound, yielded 0.06 gram of mixed alkaloids. Twenty grams of red bark, labeled No. 2, price 40 cents per pound, yielded 0.04 gram of alkaloids. Twenty grams of pale bark, price 90 cents per pound, yielded 0.03 gram of alkaloids. Twenty grams of bark, labeled Loxa, price 38 cents per pound, contained no alkaloids at all. Of these five samples only one can be considered as good.—Drugg. Circ., June 1888, 128; from Med. Herald.

Remijia Vellozii, D. C.—Remedial use, etc., of the alkaloid of the bark *Vieirine*, which see under "Organic Chemistry."

Ipecacuanha—Determination of Emetine.—Mr. A. Kremel recommends the following simple method for determining the emetine in ipecacuanha root. Equal parts (10 grams) of the powdered root, slaked lime, and water are mixed, dried on a water bath, the dry mass triturated to a fine powder, and extracted with chloroform in an extraction apparatus. The chloroformic solution is evaporated, dried to constant weight, at 100°, and the faint yellow residue calculated as emetine. The author has obtained 1.80 per cent. of emetine on the average.—Pharm. Post, 1888, 151.

Ipecac—Alkaloidal Strength and Methods of Assay.—Mr. H. W. Snow critically reviews the various methods proposed for the assay of ipecac and its preparations, both volumetric and gravimetric. For the first, the volumetric method, Mayer's reagent was employed. As an average of four determinations, he found that the precipitate with Mayer's reagent contained 40.81 per cent. emetine, results which agree well with those obtained by Dr. A. B. Lyons. For the gravimetric method he employed platinum chloride. The precipitate produced by this reagent is usually stated to contain 29.7 per cent. of platinum. The author however found that 21 per cent. is nearer the truth, the precipitate from 100 milligrams of pure emetine yielding on incineration 0.0312 grams of platinum. The method adopted by the author for the

Determination of Emetine Gravimetrically was as follows: The root is first macerated in water, then with alcohol, as recommended by Dragendorff. Take an aliquot part of the filtrate, and, after evaporating the alcohol, treat the residue with a little dilute hydrochloric acid, then dilute with water and filter, wash the residue until the washings give no precipitate with platinum chloride. To the filtrate platinum chloride is added as long as a precipitate is produced; it is allowed to stand a few hours, the precipitate collected on a tared filter, rinsing the last portion of precipitate into the filter with portions of the filtrate. The precipitate is washed twice with water, ignited, and weighed as metallic platinum. By dividing the weight by 0.312 the amount of alkaloid is ascertained.

The author published the results of some determinations of the alkaloidal strength of different samples of ipecac root and of the fluid extract both by the volumetric and the gravimetric method. These determinations show not only a considerable variation in the alkaloidal strength of the drug, as well as the fluid extract, but also a variation in the results as obtained by the two processes. He, however, considers the gravimetric method to be no more liable to error than most of the processes in use, and it possesses the advantage that there is less liability of the decomposition of the alkaloid.—Pharm. Era, Nov. 1887, 400–403; from Proc. Mich. Phar. Assoc., 1887.

Ipecacuanha—Process and Results of Assay.—Mr. Francis Ransom communicates the results of assay of ten samples of ipecac root, the proportions of emetine present varying between 1.3 and 2.3 per cent.: average for the ten samples = 1.66. The peculiarity of the author's process consists in the extraction of the powdered root by percolation with chloroform rendered alkaline by shaking with strong ammonia, and extracting the emetine from the chloroform by acidulated water, in which it is then titrated with Mayer's reagent. Yearbook of Pharm., 1887, 450–454.

Ipecacuanha—Alkaloidal Value of the Drug Cultivated in India.—A sample of ipecacuanha cultivated in India has been examined by Mr. Francis Ransom, who found the root to contain 1.7 per cent. of emetine. The process adopted was that employed by him in his above experiments. The result speaks well for the activity of the cultivated article, the cultivation of which, it is hoped, may prove quite as successful in India as has the cultivation of cinchona bark.—Pharm. Jour. and Trans., May 12, 1887, 400.

Ipecacuanha—Relative Proportions of Ligneous to Cortical Substance.—Mr. W. Stromeyer makes some practical observations respecting the pulverization of ipecac. He finds it necessary first of all to garble the drug, since it contains portions of the stem and, occasionally, also parts of foreign plants. From the best selected drug he obtained 2 per cent. of stem, while from other ipecacs of select quality he had obtained from 6 to 10 and even 14 per cent. of stem. On drying preliminarily to powdering, the drug loses on an average 4.5 per cent. of its weight. The powder should contain as far as possible the ligneous with the cortical portion. But with the observance of all precautions he fails to obtain more than 80 to 85 per cent. of the original weight of the drug as powder.

Having reason to doubt the generally accepted statement that the ligneous cord of ipecac root constitutes 25 per cent. of the drug, he has carefully separated the two in thick and thin samples of root. In the latter the proportion was 13.12 per cent. of ligneous cord, while the thicker root only yielded 11.95 per cent.—Arch. d. Pharm., March 2, 1888, 265–267.

Ipecacuanha—Description of Varieties and Substitutes.—Messrs. A. Tschirch and Franz Lüdtke communicate a lengthy paper in which the pharmacognostic and microscopic character of different varieties of ipecacuanha, as well as of false ipecacuanha and substitutes, is given. The character of the paper does not admit of material condensation, and reference must therefore be had to the original in Arch. d. Phar., May 2, 1888, 441–456.

Naregamia Alata—A Goanese Substitute for Ipecacuanha.—Mr. David Hooper describes this drug, which, as already noted by Dr. Dymock, is used by the Portuguese of Goa as an efficient emetic and substitute for ipecacuanha. (See also p. 367.) The drug consists of the root with the slender stems attached to it, the leaves having been stripped off. The root stock is contorted and warty and with the roots is pale brown in color; the mealy suberous layer may easily be removed by rubbing. The stems are of a dirty green, with the bark more firmly adherent. A transverse section of the root exhibits a brown outer layer of the bark with a light-colored interior, and a yellowish wood. If the section be touched with a drop of iodine solution, a blue ring will appear in the bark, showing the presence of starch in the librous portion. On account of the hard wood, the drug is very difficult to powder in a hand mortar. The activity of the drug resides in the cortical portion, but as this forms one-third, and the woody material two-thirds of the whole, it differs from the ipecacuanha. The powder is light-brown; it has a peculiar aromatic and pungent odor, and a slightly bitter and nauseous taste. By appropriate methods the author has succeeded in isolating an alkaloid, which he has named

Naregamine.—It formed crystalline salts with sulphuric, nitric and hydrochloric acids, but gave no satisfactory color reactions when mixed with the concentrated acids. It was precipitated from its solutions by tannin, potassio-mercuric iodide, phosphomolybdate of soda, and iodine. It differs from emetine in readily forming acicular crystals with acids, and by not giving any color with chlorinated lime and acetic acid; and it differs from the principal cinchona alkaloids by its optical inactivity. The results of the author's proximate examination are given in the following summary:

Ether extract	2.93
Alcoholic extract	5.40
Aqueous extract	7.00
Albuminous matter, etc.	7.61

Starch and cellulose	17.66
Woody fibre	44.77
Ash	5.52
Moisture	9.11
	100.00

Experiments made by Surgeon-General Bidie show the drug to be equal in efficiency to the officinal ipecacuanha. Experiments made to establish the best method of the medicinal exhibition of the drug prove the powder to be the most suitable. A tincture made with alcohol may also be used, since it holds the naregamine in perfect solution. A wine is unsuitable.—Pharm. Jour. and Trans., Oct. 15, 1887, 318.

Striated (False) Ipecacuanha—Examination.—Mr. Francis Ransom calls attention to a recent consignment of false ipecacuanha, corresponding in its character to the root described in the "Pharmacographia" as "Small Striated Ipecacuanha," and supposed by Planchon to be derived from a species of *Richardsonia*, and by others as *Psychotria emetica*, though the latter appears to be the plant from which the "Large Striated Ipecacuanha" is derived. An authentic sample of the latter and of the above sample were both examined for emetine by the author, and were found to contain but very small percentages, and they may be regarded as useless.—Pharm. Jour. and Trans., March 17, 1888, 788.

Gambier—Action on Hides, etc.—An interesting sketch of the growth, cultivation and manufacture of gambier has been communicated to the "Straits Times," and is reproduced in Pharm. Jour. and Trans. (April 14, 1888, 863–864). A few words respecting the general chemistry of gambier may find place here. Roughly speaking, good gambier may be said to contain between 40 per cent. and 50 per cent. of tannic acid, the other chief ingredient of gambier being a soluble gum: its action upon hides is to precipitate all their fatty and fleshy matter, leaving nothing but the imputrescible substance, that is to say, leather. Notwithstanding this precipitation, the hides take up so much gambier as to gain in weight by the process.

UMBELLIFERÆ.

Anethum Foeniculum—Microscopic Structure.—Mrs. Louisa Reed Stowell states that there are some marked peculiarities of structure exhibited by the fruit of the sweet fennel. The centers of the prominent ridges are small, delicate vascular bundles; these are surrounded by large, clear, empty cells. Those adjoining the vascular bundles are elongated and narrow, while those farther removed are quite irregular in shape. These cells have prominent, large oval openings from one into the adjoining cell, thus giving peculiar reticulations for fruit structures.—Pharm. Era, May 1888, 179.

Thapsia—Comparative Activity of the Resin from Various Species.—Messrs. Heckel and Schlagdenhauffen, in view of the growing scarcity of the resin from *Thapsia garganica*, have been induced to investigate the allied plant *Thapsia villosa*, L., to ascertain whether it yielded a resin having similar properties. The results were affirmative, the roots of *T. villosa* yielding to chloroform and to petroleum spirit a resin possessing vesicant properties, whilst, on the other hand, the alcoholic extract did not prove vesicant. Comparative experiments, it is true, show that plasters made from *Thapsia villosa* resin acted more slowly than those made with *Thapsia garganica* resin, acting rather as a rubefacient than as an eruptive; but, in compensation, the *T. villosa* resin does not appear to determine the insupportable pruritus that sometimes attends the application of the *T. garganica* resin.—Pharm. Jour. and Trans., July 30, 1888, 90; from Nouv. Rémèdes, July 1888, 295.

Prangos pabularia, Lindl.—*Medicinal Use, etc. of the Fruit.*—According to Mr. H. Lojander, the fruit of *Prangos pabularia*, indigenous to Thibet and Cashmere, are used there medicinally as stimulant, carminative and to promote conception. The plant is used as food for cattle. The author gives a description of the microscopic structure of the fruit. --Pharm. Post, March 18, 1888, 181; from Arch. d. Pharm., 225, 427.

Osmorrhiza Longistylis, Rafinesque--*Characters of the Essential Oil*, which see under "Organic Chemistry."

RANUNCULACEÆ.

Aconitum Lycotconum—Decomposition of Alkaloids by Heat.—See under "Organic Bases."

Cimicifuga—Existence of Cane Sugar in the Root.—Mr. C. S. Gallaher observed the formation of clear, monoclinic prisms in fluid extract of cimicifuga, prepared by the process of the U. S. P., and which has been kept about a year. He has determined the crystals to be cane-sugar, and suggests the possibility that the crystalline principle hitherto described as occurring in cimicifuga, may have been this substance.—Am. Jour. Pharm., Nov. 1887, 545.

Radix Hellebori Viridis—Value in Cardiac Affections.—Mr. Tschistouitsch has studied radix hellebori viridis to ascertain its value in various cardiac affections during the period of non-compensation. His conclusions are as follows: In six cases the medicament (15 drops of a solution of 1 to 100 of the aqueous extract every two hours), produced a diminution in the frequence and an augmentation of the force of the cardiac pulsations; increase in the quantity of urine eliminated, and a prompt disappearance of the symptoms of non-compensation. In two cases the amelioration was obtained by the simultaneous administration of the infusion of helleborus viridis and that of adonis vernalis, though neither of these, given separately, produced the desired effect. In three complicated cases, two with nephritis and one with pleurisy, the medication gave negative results.—Amer. Jour. Pharm., Sept. 1887, 443; from Bull. Gén. de Thérap., July 15, 1887.

Hydrastis Canadensis—Clinical Study of the Root.—In a clinical and pharmaceutical study of the root of *Hydrastis canadensis*, Mr. Givopiszen presents the following results, based upon a large number of clinical observations and experiments upon animals: 1. The aqueous extract, even in large quantities, did not produce toxic effects in warm-blooded animals. 2. It always caused a diminution of blood pressure without a previous augmentation. 3. It always induced contraction of the uterus and its appendages. Under the influence of an aqueous extract of hydrastis, the most intense contractions took place in cases of advanced pregnancy, or soon after delivery; the contractions were weakest in the virgin uterus. 4. Large quantities of the extract may induce premature delivery in the second period of pregnancy. As clinical results, the author concludes: 1. Hydrastis is an excellent means to combat uterine hemorrhages due to inflammation or false positions of the organ, as also against hemorrhages following the catamenial period, and in the case of too abundant menstrual losses. 2. Uterine contractions produced by hydrastis are less intense than those from ergot of rye. 3. Its use produces no untoward effect upon the organism. Even when taken for a prolonged period it causes no gastro-intestinal troubles, and often ameliorates dyspepsias which have previously existed.—Amer. Jour. Pharm., April 1888, 178–179; from Bull. Gén. de Therap., Feb. 29, 1888.

Adonis Vernalis—Preparation of Adonidin.—Mr. Wm. D. Porter obtained from the herb of *Adonis vernalis*, L., by distillation, a minute quantity of greenish volatile oil, having a faint acid reaction; by treatment of the drug with ether the amount of volatile oil was estimated at about 0.05 per cent. The glucoside, adonidin, was prepared from the tincture made with diluted alcohol by precipitating with basic lead acetate, then with sodium carbonate, and the filtrate with tannin; this last precipitate was mixed with oxide of lead, the mixture dried, exhausted with alcohol, and this solution concentrated and precipitated with ether. The coloring matter was not entirely removed, and the product was yellowish and had the properties described by Cervello.—Am. Jour. Pharm., Oct. 1887, 509.

Adonis Aestivalis—Therapeutic Value.—Dr. Albertoris speaks favorably of *Adonis aestivalis* as a heart tonic, diuretic, etc. His experiments were extended, both upon man and animals. It is given in doses of 4 to 8 grams per day either in powder or in form of infusion, the desired action becoming manifest about the third day.—Arch. d. Pharm., July 2, 1887, 640; from Ann. Chim. Farm., 1887, 198.

MAGNOLIACEÆ.

Michelia Nilagirica—Character and Examination of the Bark.—Mr. David Hooper draws attention to the bark of *Michelia nilagirica*, one of the most abundant, and, perhaps, the most characteristic of the forest trees of the Nilgiri hills. The bark is said to have febrifugal properties, but is more interesting as the source of a new aromatic essential oil which has recently attracted some attention. The bark has certain features corresponding with other well-known barks affording aromatic essential oils. The stem bark of large-sized trees dries up into single quills or channelled pieces, between ¼ and ½ of an inch in thickness. It is covered with a light brown corky layer which scales off or may easily be removed when dry; it is brittle, and its irregularly-broken surface is frequently beset with lichens and mosses. Between the cork and intermediate layer are pinkish masses of various forms. The surface of the middle layer is pale brown; in its fresh state it is marked with longitudinal green stripes; it is hard and dense, and very much resembles the bone at the base of horns. A fracture shows that the middle layer is dense and of a reddish color, and the inner layer is dirty yellowish-brown, and tough and fibrous in consistence. The inner surface of the bark is russet-brown, striated with the fine longitudinal marks of the white liber tissue. A transverse section touched with a drop of ferric chloride solution shows the presence of tannin in the two inner layers, by the greenish-black color it produces; the outer corky layer is unaffected. The bark affords a light cinnamon-brown powder, slightly bitter in taste, with a faint terebinthinate odor. The bark of the branches and younger stems has a papyraceous cork which is removable; the color throughout is uniformly pale brown; the quills without the outer coat are suggestive of cassia; the taste is not so bitter, and the odor is more aromatic than that of older specimens. The proximate examination of this bark revealed the presence of 10.6 per cent. of moisture, 9.7 per cent. of inorganic constituents (ash), volatile oil, fixed oil, acrid resinous substance, tannin, sugar, a bitter, not alkaloidal, substance, starch, gum, albuminous matter, and coloring matter. Ether extracted 4.5 per cent.; alcohol, 8.1 per cent.; cold water, 8.1 per cent.; dilute soda solution, 6.3 per cent.; the starch and wood fibre constituting 42.7 per cent. of the bark.—Pharm. Jour. and Trans., Jan. 14, 1888, 581–582.

BERBERIDEACEÆ.

Berberidaceæ—Alkaloids derived from Plants belonging to this Family.—See under "Organic Bases."

Blue Cohosh—Description of a New Glucosidal Constituent, Leontin, which see under "Organic Chemistry."

RUTACEÆ.

Buchu Leaves—Microscopic Structure and Constituents.—Dr. Y. Shimoyama contributes a microscopic study of buchu leaves in Arch. d. Pharm., Jan. 2, 1888, 64–70. The author's paper is illustrated by numerous cuts showing the microscopic character of the different portions of the leaves. In a subsequent paper (ibid. 403–407), Professor Shimoyama communicates the results of some very exhaustive experiments upon the characteristic constituent of the volatile oil which Professor Flückiger has previously described under the name of

Diosphenol.—He has redetermined the ultimate composition of this crystalline compound, and finds it, in conformity with the formula of Spica, to have the composition $C_{10}H_{16}O_2$. By the gradual addition of metallic sodium to its solution in benzol, he obtained

Diosphenol Sodium, a gelatinous body, which is however quite unstable, being decomposed even during the process of drying.

Methyldiosphenol was obtained by heating an alcoholic solution of diosphenol and potassium hydrate in equivalent proportions, with iodide of methyl in excess. It is a colorless liquid, s. g. at 15°=0.985, b. p.=232°— to 235°—, insoluble in water, easily soluble in alcohol and ether.

Æthyldiosphenol, obtained in an analogous manner, is a colorless liquid, having the same relation to solvents, as the above, s. g. at 15°=0.967, b. p.=270° to 272°.

Acetyldiosphenol is a colorless and odorless liquid, s. g. at 20°=1.032, b. p. (under partial decomposition)=269°–272°, the solubilities the same as the above.

By the *action of sulphuric acid* upon diosphenol a sulpho-acid is doubtless formed, but it has not been obtained in sufficient quantity to permit its identification of purity, character and composition. Neither could any definite results be obtained respecting the action of sodium and carbonic acid upon diosphenol, but by the *action of alcoholic solution of potassium hydrate* he obtained an acid product for which the name of

Diolic Acid is proposed. It constitutes fine, white, radiating, crystalline needles, soluble in 122.7 parts of water at 18°, in 82 parts at the boiling temperature, and easily soluble in alcohol, ether, chloroform, benzol and bisulphide of carbon. It melts at 96° to 97°, being gradually volatilized, and when strongly heated is decomposed. The elementary analysis leads to the empirical formula $C_{10}H_{18}O_3 + H_2O$. Its solutions react acid, and it readily forms salts, the author describing the barium, silver, sodium, ammonium, calcium, strontium, magnesium, copper, and ferric oxide. By the action of melting potassa upon diosphenol an acid rerembling diolic acid was obtained, but this second acid differs in the melting point, which is at 86°. By the *reduction of diosphenol* in alcoholic solution with sodium amalgam, a solid body is obtained which the author designates by the name of

Diolalcohol, diosphenol being regarded as "diolaldehyd." Diolalcohol constitutes odorless, prismatic crystals, which melt at 159°, and are only sparingly soluble in alcohol and in ether. The action of acetic anhydride in presence of dry sodium acetate upon this body has also been studied, as well as the action of bisulphide of sodium, of bromine, and of potassium permanganate upon diosphenol, but no very definite results were obtained.

Peganum Harmala, Lin.—*Medicinal Uses.*—This plant (see Proceedings 1886, 434), is described as an "African drug," although it grows as well in the sands of Spain, the Crimea and Siberia, as in Egypt. The entire plant is regarded as sudorific and emmenagogue. Dr. Pandurel, of Bombay, who prescribed it in infusion and tincture, regarded it as a powerful emmenagogue, determining slight toxic effects similar to those of Cannabis indica. The dose in amenorrhœa is given in two drachms of the tincture. Egasse, who thinks the drug merits careful study, says that "the energetic action of the aqueous or alcoholic preparations is explained by the fact that the red, resinous coloring matter is a secondary product formed by the oxidization of the harmaline."—Amer. Jour. Pharm., Sept. 1887, 443; from Nouv. Rem., July 8, 1887.

Simaba Cedron—Character of its Bitter Principle, Cedrine, which see under "Organic Chemistry."

Evodia fraxinifolia—Description of the Fruit and of the Volatile Oil—which see under "Organic Chemistry."

Hwang-Peh—A Chinese Dye-Bark—Source.—Mr. P. W. Squire, after giving an historical sketch of a Chinese dye-bark, which was first introduced into European commerce in 1879, under the name of Hwang-Peh, details the results of a microscopical comparison between this yellow dye-bark and authentic specimens of the bark of

Evodia glauca, which make it extremely probable that the dye-bark is obtained from the same plant. Chemical tests were also made and agree with those of true Evodia glauca bark, there being evidence of the presence of berberine, pectin substance, etc., known to be present in the latter.—Pharm. Jour. and Trans., March 17, 1888, 785–787.

STERCULIACEÆ.

Cacao—Unreliability of Distinction of Varieties by the Microscopic Examination of the Pigment Cells of the Seeds.—Zipperer, in his "Examination of Cacao and its Preparations" having proposed the recognition of the different commercial sorts of cacao by the character of the pigment cells of the embryo, Mr. C. Hartwig has made a series of microscopical experiments which lead him to the conclusion that the method is not available. It is true, that the intensity of color of the pigment cells varies between the different sorts of cacao, but these are not sufficiently prominent to utilize them diagnostically. Moreover, the author's observations do not agree with those observed by Zipperer; a further proof of the unreliability of Zipperer's proposition. The distinction of the seeds also, by the size of the starch granules, as proposed by Tschirch (in the paper above referred to), is not practicable. The distinctions are not insignificant, but they vary so much in the individual sorts, that it is impossible to reach absolutely certain conclusions. The author gives a detailed description of his experiments in both directions, his paper being accompanied by illustrations showing the character of the pigment cells, as well as by a resumé of his observations respecting the size and character of the starch granules, the color of the pigment cells, and the action of acids and of ferric chloride upon sections of cacao seeds from the following commercial sources: Porto Cabello, Caracas, Ariba, Machala, Ceylon, Samana, Porto Plata, Haiti, St. Thomas, Bahia, and Trinidad.—Arch. d. Pharm., Nov. 1, 1887, 958–966.

Cacao—Anatomical Structure of the Seed.—Mr. A. Tschirch gives a comprehensive anatomical description of cacao seeds, illustrated by numerous figures showing the microscopic structures of the different parts. Reference must be had to the original paper in Arch. d. Pharm., July 2, 1887, 605–608.

Chocolate—Assay of Commercial Samples.—Mr. Howard M. Smith examined five samples of commercial chocolate by the following process: The chocolate, using 5 gm. of each sample, was exhausted by maceration with petroleum spirit, and the liquid filtered off and evaporated spontaneously. The residue, after driving off the petroleum with heat, was mixed with an equal weight of magnesium oxide, macerated for two days with 50 c.c. of 80 per cent. alcohol, the mixture heated to boiling, and the liquid filtered into a tared beaker and evaporated to dryness by means of a water bath. The extract was deprived of oil by petroleum spirit, and of theobromine by ether, leaving sugar behind. The exhausted chocolate was now treated with 100 c.c. of water at 15° C., the filtrate evaporated, the extract redissolved in 10 c.c. of water, the gum precipitated by the addition of alcohol, and an additional quantity of sugar was obtained by evaporating the filtrate. The following table gives the percentage of the ingredients:

	Oil.	Theobromine.	Gum.	Sugar.	Undissolved residue.
I.	23.52	1.3	1.64	40.74	32.8
II.	22.26	.92	1.50	28.06	47.26
III.	42.4	1.74	.34	2.36	53.16
IV.	28.48	1.52	.78	3.86	65.36
V.	31.84	1.26	.66	5.02	61.22

Nos. IV. and V. were readily suspended on being stirred in hot water or milk; and all the samples were easily diffused in those liquids by boiling for five minutes.—Abstract from the Author's Thesis in Amer. Jour. Pharm., June 1888, 277–278.

Heritiera Littoralis, Aiton—Substitution of the Seeds for Kola Nuts.—All parts of this tree, growing in eastern Africa, India, the Philippines, and Australia, and the red-brown seeds, have also a bitter taste. Messrs. Heckel and Schlagdenhauffen have observed these seeds as an adulteration of kola nuts. They are readily distinguished from the latter by their nearly orbicular and flattened shape, with a diameter of about 4 cm., and a thickness of 10 to 12 mm., and by one of the fleshy-white cotyledons being only of about half the size of the other. The starch grains are polygonal, and only one-half the size of the kola nut. These *false kola nuts* do not yield any caffeine; they contain fixed oil, 4.4 per cent.; tannin and coloring matters, 5 per cent.; sugar, 5.7 per cent.; cellulose and starch, 56 per cent.; lignin, 12.4 per cent.; albuminoids, 13.5 per cent.; and salts, about 3 per cent.—Amer. Jour. Pharm., Sept. 1887, 446; from Nouv. Rem., 1887, 123.

TERNSTROMIACEÆ.

Tea—Examination of Different Kinds.—Dr. B. H. Paul and Mr. A. J. Cownley record some chemical notes on tea, and give the results of the examination of 28 samples, as follows:

	Approximate elevation of place of growth.	Moisture per cent.	Theine, per cent.	
			Original tea.	Dry tea.
Ceylon Tea.	Ft.			
1. Penhros	2500	6.8	4.56	4.89
2. F. L. C.	. . . .	6.0	4.56	4.85
3. Nahalma	300	5.6	4.54	4.80
4. Hairs from tea leaves	. . . . . .	6.6	2.40	2.57
5. Hardenhuish Pekoe	3500	3.8	4.08	4.24
6. Woodstock Pekoe Souchong	4200	3.6	3.44	3.57
7. Radella Broken Pekoe	4800	4.6	4.10	4.30
8. Morton Pekoe	400	4.2	3.98	4.15
9. Penhros Broken Pekoe	2500	6.4	4.64	4.96
10. Strathellie Orange Pekoe	2000	5.4	4.10	4.33
11. Nahalma Orange Pekoe	300	5.4	4.06	4.29
12. Venture Orange Pekoe	4300	5.4	3.74	3.95
13. St. Leys Pekoe Dust	4600	5.6	3.46	3.66
14. Venture Pekoe Souchong	4300	4.8	3.40	3.57
15. Venture Broken Orange Pekoe	4300	6.6	3.98	4.26
16. Calsay Pekoe Souchong	5000	6.2	3.22	3.43
17. Venture Pekoe	4300	5.6	3.48	3.68
18. St. Clair Orange Pekoe	4200	4.6	3.90	4.09
Indian Tea.				
19. Pekoe tips, picked out	. . . .	7.56	4.27	4.62
20. Broken Pekoe	. . . .	7.00	4.48	4.81
21. Pekoe	. . . .	6.40	4.16	4.44
22. Orange Pekoe	. . . .	4.80	4.66	4.89
23. Pekoe	. . . .	5.60	4.48	4.74
24. Broken Pekoe	. . . .	4.80	3.76	3.95
25. Pekoe	. . . .	5.40	3.66	3.86
26. "Weak" tea	. . . .	6.80	4.06	4.35
27. "Strong" tea	. . . .	5.80	4.18	4.43
28. Mixture	. . . .	6.00	3.64	3.87

The method of assay was the same as that employed by them for the determination of caffeine in coffee (see Proceedings 1887, 333–334). The authors find that in the preparation as a beverage there is a great waste of theine, only about one-half of that in the leaves being extracted. To extract the rest of the theine in the spent leaves, they have to be extracted repeatedly with boiling water. The broker's test being applied to the extraction of the leaves obtained in the ordinary way of tea-making, the small percentage of theine found in samples is readily accounted for. By this method only 20 per cent. of extract is obtained, whereas a thorough extraction gives about 35 per cent.—Pharm. Jour. and Trans., Nov. 19, 1887, 417–419.

GUTTIFERÆ.

Nag-Kassar (Nag-Kessar)—Application of the Term to Different Drugs.—Under the name of *Nag-Kassar*, *Nag-Kessar*, and similar names, the flower of an evergreen Indian plant, *Calysaccionsen Ochrocarpus longifolius*, Benth. et Hook., is found in European collections, and described as having been in use from ancient times as perfume and coloring matter. Prof. P. Ascherson now calls attention to a new drug, which has been introduced from India under the same name, but is composed of the anthers of a plant which has been identified to be

Musca Ferrea, L.—This tree abounds in Southern Asia and the eastern Himalayas, and is cultivated in the gardens throughout India and Java, on account of its handsome and highly odorous flowers. An excellent description of the plant is given by Kanny Soll Dey in "The Indigenous Drugs of India," Calcutta, 1867. The drug has the odor of violets, and is remarkable in that it is perhaps the first example in which the anthers of a flower are the sole constituents of a drug.—Pharm. Post, May 6, 1888, 293–294.

VITACEAE.

Grape Culture—Effect of Mildew.—Mr. Henry Snyder Mauger contributes an interesting paper upon the effect of mildew upon grape culture. He observes that many of the best varieties do not succeed solely on account of their foliage being destroyed more or less by the fungus, the most prevalent form being *Peronospora viticola*, Berk., and that the criterion of a useful grape depends solely upon its freedom from mildew on the leaves, and not on the flavor or other good qualities of the fruit. His observations will be consulted with interest.—Amer. Jour. Pharm., Sept. 1887, 433–437.

Native Wines—Manufacture.—Mr. C. B. Spofford advocates the preparation of native wines by the pharmacist, and gives the following directions: Choose sound, ripe fruit, rejécting all unripe or rotten. Mash to a pulp in a tub or other suitable wooden vessel, using a wooden maul. Allow the fermentation to take place in a cask, which should be bunged, a hole being bored into the bung to admit a rubber tube, the lower end of which is placed in a vessel containing water. This prevents a free circulation of air over the wine, while it allows the gases of the fermentation to escape. In most cellars active fermentation will cease in ten to fourteen days. When it has passed it should be bunged up tight, or, better still, drawn off and placed in another clean cask. It is dangerous to leave it a much longer time, lest acetic fermentation take place, in which event good vinegar is produced. When being drawn off, collect only the clear portion, the cloudy portion is put to rest in large bottles, from which it may be drawn off clear and the rest rejected. By placing the cask in a moderately warm place, the wine will finish in six months. The author gives a method also for preparing wine from the *wild grape*, *blackberry*, *currant*, and *elderberry*, as follows:

To 32 quarts of the mashed fruit, 2 gallons of water are added. After 24 hours the liquid is strained off, the pulp is treated with 1 gallon of water, and expressed in a wooden press. The 5 gallons of juice so obtained are then fermented as above after the addition of 3 pounds of sugar for each gallon.—Pharm. Era, Feb. 1888, 49–50; from Proc. N. H. Pharm. Assoc., 1887.

Natural Ferruginous Wine—Occurrence, etc.—Mr. Sambuc draws attention to the occurrence of a large percentage of iron in a wine cultivated at Seyne (Var.), the quantity of iron being sufficient, in fact, to constitute it a ferruginous wine. He states that the wine comes from American stock, and is known as the "Jacquez." The proportion of peroxide of iron ordinarily found in wine is from one to two cgm. per litre. Of the wines analyzed by Mr. Filhol, those richest in iron contained but three cgm. The wine referred to by Mr. Sambuc contained eleven cgm. He thinks that if it preserves its ferruginous richness during future crops it will rise to a high rank as a therapeutic agent. It seems likely to retain its qualities, not only on account of the presence of iron in the schistous soil in which it is grown, but from the richness of the Jacquez wine in coloring matter and œnocyanin.—Amer. Jour. Pharm., Dec. 1887, 610; from Jour. de Phar. et de Chim., Oct. 15, 1887.

Wines—Analyses of Different Sorts.—Mr. E. Reichardt reports the results of a large number of wines, embracing the principal sorts produced in Europe. The report may be referred to in Arch. d. Pharm., April 1888, 292–299.

Red Wine—Determination of Blue-berry Juice.—According to Mr. T. Nakahama, the presence of blue-berry juice in red wine can be detected with certainty only by means of tartar emetic solution. A blue-red color is produced at once in the presence of 30 to 50 per cent. of the juice, while a less quantity, to 20 per cent., yields the color after standing over night.—Chem. Rep. (Chem. Ztg.), Jan. 29, 1888, 31; from Arch. f. Hygiene, 1887, 7, 405.

Wine—Estimation of Salicylic Acid, which see under "Organic Chemistry."

ERYTHOXYLACEÆ.

Coca—Change in Character during Transportation.—Dr. H. H. Rusby delivered a highly interesting lecture on "Coca" at the Philadelphia College of Pharmacy, in which some facts are brought forward that go far to explain the differences observed in the action of the drug when it reaches this country from that reliably described as having been observed in the countries of its growth. He says that there are two distinct varieties that yield true coca, though both plants are properly Erythroxylon coca. The one variety comes from Cuzco, in Peru, the other from La Paz, in Bolivia, and the latter he considers the most valuable variety. This Bolivian variety is characterized by its smaller leaves. The author says that coca is liable to a peculiar disease, called taja, which appears to be due to a fungus, and can be produced in the leaf by simply picking them carelessly, so that the twigs are wounded, when at the next growth of leaves they present the appearance indicative of the disease. It follows that cultivators, who are doubtless aware of this fact, observe proper care in the collection of coca, and do not, as is sometimes stated, collect the leaves by beating them from the plant with poles. But the most remarkable observation is that the coca, when assayed by titration with Mayer's reagent, will give evidence of a large percentage of *alkaloid* in Bolivia, while the identical article, after exportation, will not assay more than one-half to three-fourths of one per cent. of cocaine by the same method. During a second journey to Bolivia he gained some further light on this subject. He found that coca leaves, assayed as before, gave the same large results by titration; but on separating the cocaine, only from one-half to three-fourths of one per cent. of that alkaloid was obtained. It is evident, therefore, that in its native condition coca contains other substances than cocaine that give a reaction with Mayer's reagent, but that these are destroyed during transportation to foreign countries. These observations may account largely for the difference in the action of coca. It is certain that no coca that has reached this country has the action that travelers—among them Humboldt, Poeppig, and others—have ascribed to it in its native country.—Amer. Jour. Pharm., April 1888, 199–201.

Erythroxylon Coca—Proximate Examination of India-grown Leaves.—At the request of Mr. R. Blechynden, Junior Secretary of the Agricultural and Horticultural Society of India, Mr. C. J. H. Warden has made analyses of a number of samples of coca leaves grown in India, and now gives the results of his examination in a comprehensive paper, which must be regarded as one of the most valuable recent contributions to the chemistry of coca. The process selected by the author for the determination of the alkaloid in the leaves, is that of Dr. E. R. Squibb (see Proceedings 1885, 325), which he has, however, found it necessary to modify in order to obtain control experiments. The results of analyses are given in a series of tables: No. 1 embracing the general results; No. 2 the character of the ash, and No. 3 the percentages of ash and alkaloid calculated for the anhydrous leaves. Table No. 4 simply contains a description of the sources and methods of curing the different samples of leaves examined. Of these tables, No. 1 may properly be reproduced here, and is as follows:

District in which sample was grown.	Moisture per cent.	Ash per cent.	Crude Alkaloid.	Crude Alkaloid calculated on anhydrous leaves.	Remarks.
Ranchi, young leaves .	6.18	6.30	1.069	1.139	Leaves sound.
Ranchi, mature leaves.	8.22	8.25	.811	.883	"
Arcattipore, Cachar, 1st sample	6.08	6.97	1.286	1.369	"
Arcattipore, Cachar, 2d sample	6.72	5.94	1.560	1.671	"
Central Terai Tea Co., Dargerling.	10.37	6.80	1.090	1.115	"
Agri. Hort. Soc. Gardens, Alipose, Calcutta . .	10.42	9.17	.322	.358	"
Matelli Tea Co. . . .	9.30	11.05	.938	1.022	"
Chulsa, Julpaguri, Dooars	5.71	7.14	.576	.610	"
Jaunpore district . . .	10.05	11.37	.515	.571	"
Leaves from druggists in Calcutta, source unknown	13.34	9.77	.045	.051	Old, musty; foreign leaves present.

A remarkable distinction in the character of the alkaloid from that described by Squibb, was the utter failure of the crude alkaloid obtained by the evaporation of the ether-extract to show a tendency to spontaneous crystallization even in a single instance. In order to determine whether or not the process of assay was at fault, the author made a series of experiments, which however proved that it was not the method of assay that caused this distinction. Thinking that possibly the mode of curing the leaves, by artificial heat, might have caused a change in the alkaloid, he secured some fresh leaves, plucked in the morning of the day they were operated upon, but here also he failed to obtain an ether extract that showed any tendency to crystallization. It appears evident, therefore, that the alkaloid exists in these India-grown leaves in an amorphous condition, though further experiments appear to be necessary to determine its precise nature. The author also draws attention to the variation in the amount of *Coca-tannic acid* (which see under "Organic Chemistry") observed in the different samples examined. He has, furthermore, endeavored to isolate the reputed alkaloidal constituent *hygrine*, but failed to find the slightest indications in the watery distillates from fresh and undried leaves. The remaining portion of the author's paper pertains mainly to the coca-cultivation experiments in India.—Pharm. Jour. and Trans., June 2 and 9, 1888, 1010–1012 and 1027–1032.

Coca—Improved Process for its Assay.—Dr. E. R. Squibb has improved the process for the extraction of cocaine by abandoning the use of dilute sulphuric acid and substituting kerosene, the kind that is known in commerce as "water-white, 150° test oil," and gives details of the process in accordance with this modification. On the basis of this, also, he describes an improved process for the assay of coca leaves. He calls attention, in the first place, to the necessity of securing a uniform representative of the particular lot of the drug in form of powder, since in grinding and sifting the twigs and fruit, which contain little or no alkaloid, pass through last. The powder should therefore be well mixed before weighing out the portion for the assay. One hundred grams of this is moistened thoroughly with 100 c.c. of a 7 per cent. solution of crystallized carbonate of sodium, packed at once into a percolator, and percolated to about 700 c.c. of percolate, with kerosene. The percolate is shaken out thrice successively with 30 c.c. of water containing 2 per cent. of hydrochloric acid. The acid solution is well washed with 30 c.c. of strong ether to remove adhering oil and coloring matter, this ether solution being rejected. Then 20 c.c. of ether are added to the washed acid solution, and the quantity of carbonate of sodium found to be necessary to decompose the acid hydrochlorate (by saturating a portion of the dilute acid used) is added in small quantities at a time, and 5 per cent. of carbonate of sodium having been added in excess, the whole is well shaken, and the ether layer transferred to a tared beaker. This shaking out is repeated twice with 20 c.c. of fresh ether, the united etheraal solutions are evaporated, dried at 100° C. and weighed as cocaine. The author records the assay of 324 bales of coca, representing 26 lots, which gave the following percentages: .916, .714, .806, .588, .628, .571, .753, .778, .973, .498, .983, .854, .528, .637, .647, .706, .852, .716, .747, .560, .839, .777, .795, .755, .662, and .338 per cent. Respecting the

Chloroform Test for the purity of the hydrochlorate, the author observes that he has reached an improved practice, in that he now uses only chloroform that has been recently shaken with strong sulphuric acid, while the salt is dried at 100° C., noting the loss in drying, and then weigh off the 0.4 gram of the dried salt. Taking these precautions it is now not uncommon to find salts so good as to require 10 to 12 c.c. of dry chloroform to dissolve 0.4 gram of dry salt, whilst a year ago none were found requiring over 7 to 8 c.c.—Ephemeris, June 1888, 1101–1106.

Coca—Method of Assay.—Mr. Koehler describes his method of assaying coca leaves as follows: Mix 50 gms. of finely pulverized leaves with 5 gms. of dry carbonate of sodium and 15 gms. of oxide of lead; macerate with 50 gms. of water and dry *in vacuo* in a large vessel at the temperature of the water bath. The dried mass is agitated with 250 gms. of benzin in a large flask; in twenty-four hours filter and recommence the process with an equal quantity of the solvent. The benzin extracts are then placed in a receiver and reduced in partial vacuum to 200 gms.; the temperature of the bath should not exceed 30° to 40° [86° to 104° Fah.] The extractive is then briskly agitated with 100 gms. of 1 to 100 HCl in water. After frequent agitation for an hour, decant and wash the benzin extract again with 50 c.cm. of acidulated water as before. The cocaine is entirely dissolved by the acidulated water. To free from the coloring extractive wash the hydrochloric liquor two or three times with 20 cm. of ether. The alkaloid is displaced by an excess of carbonate of sodium and extracted with 20 gms. of ether; after a brisk agitation the ether is decanted, and replaced by a new supply, etc. The cocaine passes wholly into the ethereal extracts. These are evaporated into the free air and the alkaloid separates, partly in long fine needles, and partly in thick crusts and blended crystals. These are dried *in vacuo* over sulphuric acid and weighed.—Amer. Jour. Phar., March 1888, 238; from Répert. de Pharm., March 1888.

Coca Leaves.—Yield of cocaine from different samples of coca leaves of various ages. See *Crude Cocaine*, under "Organic Chemistry."

Coca.—Existence of hygrine in the fresh leaves. See *Hygrine*, under "Organic Bases."

MELIACEÆ.

Naregamia Alata—Examination of the Root and Stems.—Mr. David Hooper draws attention to a drug used in Goa as an emetic and which has been described by Dr. Dymock in his "Vegetable Materia Medica of Western India." (See also p. 353.) It is composed of the root and stem of *Naregamia alata*, and is known as

Goanese Ipecacuanha, and is regarded by Dr. Dymock as the best indigenous emetic that he has met with in India. The appearance of the drug is described by Mr. Hooper as follows: The drug consists of the root with the slender stems attached to it, the leaves having been stripped off. The root stock is contracted and warty, and with the roots is pale brown in color; the mealy suberous layer may easily be removed by rubbing. The stems are of a dirty-green, with the bark more firmly adherent. A transverse section of the root exhibits a brown outer layer of bark with a light-colored interior, and a yellowish wood. If the section be touched with a drop of iodine solution, a blue ring will appear in the bark, showing the presence of starch in the liberous portion. On account of the hard wood, the drug is difficult to powder in a hand mortar. The activity of the drug resides in the cortical portion, which constitutes one-third of the root. The powder is light-brown, has a peculiar aromatic and pungent odor, and a slightly bitter and nauseous taste. Among the more important constituents are an alkaloid, an oxidizable fixed oil, and wax. The alkaloid was obtained as an amorphous, slightly colored, brittle substance, which formed crystalline salts with sulphuric, nitric and hydrochloric acids, and for which the author proposes the name of

Naregamine.—This differs from emetine in readily forming crystals with acids, and by not giving any color with chlorinated lime and acetic acid, and from the principal cinchona alkaloids by its optical inactivity. It is precipitated by alkaloidal reagents. A second crystalline alkaloid, allied to if not identical with asparagin, was also found in the root. The action of solvents upon the drug is summed up as follows:

Ether extract	2.93
Alcoholic extract	5.40
Aqueous extract	7.00
Albuminous matter, etc.	7.61
Starch and cellulose	17.66
Woody fibre	44.77
Ash	5.52
Moisture	9.11
	100.00

Medicinally it was found emetic in doses of 20 grains, but it cannot be given in form of wine, since the tannic acid of wine precipitates the naregamine. The author suggests a tincture prepared with rectified spirit of the strength 2½ ounces to 1 pint; but the powder will probably be preferably used.—Pharm. Jour. and Trans., Oct. 15, 1887, 317–318.

SAPINDACEÆ.

Guarana—Collection and Preparation.—Dr. H. H. Rusby, in a lecture at the Philadelphia College of Pharmacy, gives an interesting description of the localities in which the guarana plant grows wild. The collection of the drug from the wild plant, however, presents insuperable difficulty. It has long been cultivated in the region of the lower Madeira, as well as a little further south and perhaps a little east. In the cultivated state it presents a very different aspect from what it does in the wild state. It is planted out just as a vineyard is planted, except that it is planted wider apart and trained to poles the same as hops. The plant is kept within bounds by pruning. The ripening of the seeds is shown by the opening of the pods. Immediately upon this the fruit is gathered to prevent the inevitable loss which would occur from its falling. This fruit resembles the hickory nut. It is contained in a husk, which husk consists of three instead of four parts. From these the seeds are shelled out by hand as hickory nuts are. First they are washed free from a phlegmy substance and then subjected to a roasting process of six hours' duration, which loosens from them a papery shell, which is removed by placing them in sacks, and beating them with clubs. The best varieties of guarana are those in which the seeds have not been very finely broken. A small amount of water is then added, just sufficient to form a mass. It is kneaded by hand into a mass of the consistency of dough. He has been informed that the common belief in this country is that other materials are added to this mass by which it is adulterated. The fact is that other things are not generally so added. A large building is then utilized for the drying purpose. Upon the upper floors of this building this material is spread out and subjected to a slow fire of fuel, selected with a view of making no smoke, the object being to keep the temperature equable, maintaining at the same time sufficient heat. It is exposed in this way for a certain number of weeks, when it is ready for the market. Great experience is necessary to carry on this process. This is the manner in which it is prepared in its own home. It is used there by the natives, a portion being grated off with a large file, and it is served in a glass full of cold water. Its effects are very refreshing, but its excessive use is deleterious. It contains two or three times the quantity of caffeine that coffee does, producing a happy effect on the nervous system, but if used in excess bringing on trembling and a palsied condition of the limbs.—Amer Jour. Pharm., May 1888, 266–267.

Guarana—Determination of Alkaloid.—Mr. A. Kremel recommends the following method for determining the amount of caffeine in guarana: Digest 10 gm. of powdered guarana with 100 gm. of 25 per cent. alcohol, in a tared flask on a water bath, for 1 or 2 hours. After cooling replace the loss of weight with 25 per cent. alcohol, thoroughly shake the mixture, and filter off 50 grams. Add a sufficient quantity of slaked lime to the filtrate, and evaporate to dryness in a porcelain capsule. The residue is reduced to fine powder and extracted with chloroform. Upon evaporating the chloroform solution, the caffeine is obtained in absolutely colorless crystals. The crystals are dried at 100° C. and weighed. By this method guarana of commerce yields from 3.12 to 3.80 per cent. of pure caffeine.—Pharm. Post, 1888, 101.

Macassar Oil—Source, etc.—According to Messrs. Gehe & Co., the oil of the seeds of

Schleichera trijuga, growing in India, has recently been introduced into German commerce under the name of macassar oil. It proves a very efficient and stimulating agent for the scalp, both cleansing it and promoting the growth of the hair. The tree being common in India, Ceylon, and Burmah, there should be no difficulty in obtaining a supply of the oil. The oil is used in India chiefly for illuminating purposes, and sometimes medicinally for the cure of the itch. The tree is one of the plants upon which the lac insect feeds, and considerable quantities of shellac are collected from its young branches.—Pharm. Jour. and Trans., Dec. 3, 1887, 460.

POLYGALACEÆ.

Senega—Causes of the Abnormal Structure of the Root.—Mr. Arthur Meyer has studied the causes and significance of the abnormal structure of senega root, a subject which has elicited examinations and descriptions of the root by various investigators. He gives the details of his examination in a lengthy paper, accompanied by numerous illustrations showing the peculiarities of the root. The abnormal structure of the root is due to the influence of the following characteristics:

1. Particular firmness of the ligneous portion.
2. Ready liability to injury of the cambium and the sieve-tube leaders carrying the nutrient substances.
3. Particularly strong contraction of the bark parenchyma.
4. Tendency to form particularly broad, large-celled and non-ligneous primary medullary rays.
5. Bi-linear position of the primary branch roots.

The very strong contortions of the tap-root and of the branch-roots, which may be produced by the influences named, have in all probability special biological significance for the senega plant. This possesses numerous tender buds, which must be securely buried in the ground if they are not to be destroyed; hence the plant must be drawn deeper into the ground from year to year. This drawing into the ground, which is accomplished by the contracting roots, must in the case of the senega plant be particularly difficult on account of the broad crown of the root, and it is therefore readily understood that the plant will require every possible arrangement that is conducive to the rapid contraction of the root. Such an arrangement appears to be provided by the abnormal structure of the root.—Arch. d. Pharm., July 1, 1887, 557–568.

PAPAVERACEÆ.

Poppy—Percentage of Morphine in Various Organs.—Mr. E. Dieterich has examined the flowers of the red poppy (*Papaver Rhœas*), and the capsules and seeds of the common poppy (*P. somniferum*), to ascertain the quantity of morphine which they contain. For this purpose, he prepared extracts from these several organs, either with water or diluted alcohol, the menstruum having considerable influence upon the amount of extracted alkaloid. His results are given as follows:

	Morphine.	
1. Red poppy (fine) extracted with water	0.7	per cent.
2. Red poppy (inferior) extracted with diluted alcohol	0.14	"
3. Poppy heads (fine) extracted with water	0.032	"
4. Poppy heads (inferior) extracted with diluted alcohol	0.16	"
5. Poppy heads (unripe, dried) extracted with diluted alcohol	0.086	"
6. Poppy seed (white) extracted with diluted alcohol	0.005	"
7. Poppy seed (bluish) extracted with diluted alcohol	——	

Amer. Drugg., June 1888, 107; from Rundschau (Prag), 1888, No. 16.

Australian Opium—Quality and Composition.—Mr. W. E. Mathews states that the greater part of the colonial (Australian) opium found in the Melbourne drug market comes from the Bacchus Marsh district, where the cultivation of the poppy has been carried on for the past eighteen or twenty years. The first supply of opium sent into the market from this district was in 1871, and scarcely a season has been missed since. After giving a description of the manner of cultivating and collecting the opium, the author observes that a sample of the opium collected last season at Bacchus Marsh, assayed in accordance with the *British Pharmacopœia*, yielded 11.5 per cent. of morphine in the dry powdered opium. A small sample from Queensland gave 9.8 per cent. of morphine by the same process. An analysis of the Bacchus Marsh opium gave the following results: Morphine, 10 65; codeia, .55; narcotine, 6.48; narceine, 6.11; gummy matter, 26.70; mucus, 21.62; resin and oily matters, 6.80; water, 9.19; undetermined and loss, 11.90; total, 100.00. A batch of extractum opii, prepared from one pound of colonial opium, yielded a product of 9.3 ounces of a good extract of full alkaloidal strength.—Austral. Jour. Pharm., Nov. 1887, 393.

Opium—Lawful Strength.—Mr. B. F. Davenport, in view of the practice in the N. Y. Custom House of assaying opium by what is known as "Squibb's method," and that this method gives higher results than the U. S. P. method, addressed an inquiry to the Secretary of the Treasury respecting the lawfulness of this practice. He was informed that "By Department's ruling September 5, 1879 (S. 4176), concerning the test of opium by the appraisers, it was held that such officers were not confined to any special mode of making the required test, and that the matter was left to their judgment." Inasmuch as this ruling refers to the law as laid down in the "General Regulations," edition of 1874, which requires that all drugs coming from foreign countries, with the exception of those coming from England, Scotland, France, and Germany (which must conform to the Pharmacopœias of those countries), shall conform to the requirements of the U. S. Pharmacopœia, Mr. Davenport addressed a second letter to the Treasury Department, drawing attention to this fact, but received a reply simply confirmatory of the previous ruling.—Drugg. Circ., March 1888, 52–53.

Opium—Correction of U. S. P. Process of Assay.—In the U. S. P. process for assaying opium, seven grams of the drug are treated with 70 c.c. of water and 3 grams of lime, and of the filtered fluid 50 c.c. are taken to represent 5 grams of the drug. Attention has been drawn by different writers to the evident error in supposing that 50 c.c. actually represents 5 grams of opium, since no allowance is made for the volume of the extracted matter held in solution; but the writers fail to agree as to the exact (or approximately exact) increase that should be allowed in measuring the quantity to represent 5 grams of the drug, the increase in the measurement recommended ranging from 1 to 3 c.c. Dr. A. B. Lyons discusses this subject in a paper read before the Mich. State Pharm. Association, and reports the results as well as the experiments made at his request, by Mr. Frank A. Thompson, from which he makes the following deductions: 1. That the opium yielded about 37 per cent. of extractive to the solvent. 2. That the total measure of fluid was about 71.3 c.c. (71.28 to 71.37); and 3. That the assay process should direct to use very nearly 51 c.c. (50.9 to 50.98) of the filtrate to represent 5 grams.—Pharm. Era, Jan. 1888, 9; from Proc. Mich. St. Pharm. Assoc., 1887.

Opium—Squibb's Improved Assay.—Dr. E. R. Squibb communicates some improvements in his process for the assay of opium (see Proceedings 1882, 229–231) which have suggested themselves during an experience of more than five years since its publication. The following is a brief outline of the improved process (which is given in some detail and to which reference may be had in "Ephemeris," October, 1887, 965–971) as applied to the assay of powdered opium:

(1) 10 grams of the powdered opium are digested with 100 grams of cold water for 12 hours with frequent shaking, the liquid being acidulated with one or two drops of dilute sulphuric acid, if not already acid to litmus paper. The whole is poured on a tared filter, the residue on filter washed with water to 150 grams of filtrate, which may be designated as "percolate No. 1."

(2) The residue on filter is carefully returned to the flask, 50 grams of water added, and in the same manner as before 150 grams of liquid obtained—"percolate No. 2."

(3) The residue on filter is percolated to the extent of about 20 grams more—"percolate No. 3," which is to be used for rinsing the vessels, etc., in the subsequent operations.

(4) Percolate No. 2 is evaporated in a tared capsule to about 20 or 30 grams; then percolate No. 1 is added, and the evaporation is continued until the whole is reduced to about 10 grams, not less and not much more. The dense solution is transferred to a flask, rinsing the capsule, and making the weight of the whole not less than 16 nor more than 22 grams. Then half its weight of alcohol, s. g. 0.817 to 0.820 is added to the solu-

tion, the mixture is shaken, 15 grams of ether of s. g. 0.725 are added, and the whole is then well shaken.

(5) To the well-shaken mixture of opium extract, alcohol and ether, 4 grams of solution of ammonia of s. g. 0.960 are now added, the mixture shaken and allowed to stand over night. The ether-layer is decanted as closely as possible, observing that no crystals of morphine shall be carried with it, and 15 grams of fresh ether are poured into the flask, which is rotated so as to cause a thorough rinsing of the sides of the flask, and then decanted as before ; a third portion of 15 grams of ether is used in exactly the same way.

(6) The crystallized morphine is collected on a double filter with the usual precautions and washed, observing that the filtrate and washings shall not exceed 40 c.cm. The morphine is dried to constant weight at 212° F. and then weighed, using the outer filter as a counterpoise for the inner.

(7) About 0.1 gram of the morphine so obtained is now agitated with 10 c.cm. of lime water in a test tube. If the morphine dissolves to a solution which is nearly or quite transparent, and from which no weighable precipitate settles in an hour, then the contents of the filter are accepted as being practically pure morphine. Otherwise, 0.5 gram of the powder is agitated with 50 c.cm. of lime water, the solution filtered through a double tared filter, the filter washed with 3 to 5 c.c. of the rinsings of the vessel in which solution was effected, then with 5 c.c. more of water, and dried to constant weight. The weight of this, calculated for the whole quantity of crude morphine obtained, is deducted from the latter as impurity.

Persian Opium—Special Modification of Squibb's Method of Assay.—Dr. Squibb observes that of late years Persian opium has improved so much in quality as to enter the markets in competition with the opium of Anatolia. In conducting the assay of this kind of opium, however, it is advisable to remove some of the extractive in the aqueous extraction, since it contains so much more extractive than does Turkey opium, that the various steps of the assay are impeded. To this end the watery solutions of opium are evaporated, in the manner above described, to about 1.25 times the weight of the opium, and the dense solution is then patiently rinsed round the large capsule until all the rings of extract are entirely redissolved in the solution. Then about 8 times the weight of the opium (100 c.cm., for 10 grams) of alcohol of a s. g. not above 0.820, is added to the dense solution little by little with constant stirring, the whole is closely covered and set aside until the solution is perfectly clear. The clear solution is decanted, the residual black mass is dissolved in 3 c.cm. of water, and 25 c.cm. of alcohol added in the same manner as before; after the addition of all of this second portion of alcohol, however, the mixture is boiled, the loss of alcohol evaporated being supplied, and it is then set aside to cool and clarify. This second alcoholic solution is added to the first, and the residue is treated once more in the same way. Finally the three united portions of alcoholic solution are evaporated to about the weight of the opium originally employed, and the depurated aqueous solution thus obtained is treated precisely as the concentrated aqueous solution from Turkey opium.—Ibid., 975–981.

Opium—Intervention of Pumice to Facilitate Extraction by Squibb's Method of Assay.—Mr. Walter Allen, in attempting the application of Squibbs' method of opium assay to the tincture, met with a difficulty by reason of the adhesion of the extract to the sides of the evaporating dish when the menstruum is driven off. If 100 c.c. to 120 c.c. of the tincture had been used, probably the valuation could have been completed by the method chosen; but as the object was to select a method applicable to smaller quantities, that the cost might thereby be lessened, recourse was had to the use of washed powdered pumice stone to divide the extract, so that by percolation, water would exhaust all the constituents soluble in that fluid. After several trials it was found best to evaporate the tincture, adding the pumice from time to time, until all the alcohol had been evaporated and the fluid was as dense as very heavy syrup. For the assay 30 c.c. of tincture (calculated as 1.01 fluidounces at the end of the assay) were measured from a burette into a 4 oz. evaporating dish and evaporated on a water bath, with the addition of powdered pumice, until the syrupy fluid was had as above; then 10 c.c. of water were added, and mixed thoroughly, using a glass rod for the purpose. The mixture was placed on a small, plain folded filter, only a little larger than necessary to contain it, and percolated with water thrown on the filter and contents with force from a wash bottle, using care that none of the contents were thrown out and lost. The percolate was collected in portions of about 100 c.c. each for the first two portions, and about 30 or 40 c.c. for the third portion. Carried this far with care, the percolate coming through when acidified with diluted sulphuric acid gave only a faint cloud with potassio-mercuric iodide, showing the alkaloids to have been practically exhausted. The assay was completed by Squibb's method, making the liquid weigh after evaporation 65 grains, equal to 1.5 times the weight of opium in the tincture, estimating the average weight of 1 fluidounce of the tincture as 430 grains.—Drugg. Circ., March 1888, 53.

Opium—Dieterich's Method of Assay.—Mr. E. Dieterich has revised his method in some minor details, and now communicates his improved method as follows:

I. *For Opium.* Triturate 6 gm. of the finely powdered opium in a mortar carefully with 6 gm. of water, dilute and wash the mass with water into a suitable tared flask, and add enough water to make the mixture weigh 54 gm. Macerate, with frequent stirring, during 1 hour, and then filter through a plaited filter of a diameter of 10 centimeters. Take 42 gm. of the filtrate, mix it with 2 c.c. of normal ammonia, *without strong agitation*, and pass it at once through a ready prepared plaited filter of 10 centimeters diameter. 36 gm. of this filtrate, representing 4 gm. of opium, are mixed in an exactly tared Erlenmeyer flask, bicircular rotation, with 10 gm. of ether; next 4 more c.c. of normal ammonia are added, the swinging or rotating motion continued until the liquid has become clear, the flask then corked and set aside. After standing 5 or at most 6 hours, the ether layer is first transferred, as completely as possible, upon a plain filter of 8 centimeters diameter; then 10 c.c. more of ether are added to the contents of the flask, the whole again rotated and the ether layer passed through the filter. When this has run through, the aqueous solution is poured in without having regard for the crystals which adhere to the walls of the flask. Finally, the latter, as well as the filter, are washed with two successive portions of 5 c.c. each of water saturated with ether. After the flask and filter have been allowed to drain well, both are dried at 100° C., the minute quantity of matter retained by the filter transferred to the flask, and the drying continued to a constant weight.

II. *For Extract of Opium.*—Dissolve 3 gm. of the extract in 40 gm. of water; mix the solution without unnecessary agitation, with 2 c.c. of normal ammonia, and pass at once through a filter of 10 centimeters diameter; 30 c.c. of this filtrate, corresponding to 2 gm. of the extract of opium, are then treated further, as directed under I. for opium.

III. *For Tinctures of Opium.*—50 gm. of tincture of opium are evaporated in a tared capsule, upon a water bath, to 15 gm.; this is diluted with water to weigh 38 gm., 2 c.c. of normal ammonia are added, the whole mixed by once agitating, and immediately passed through a ready prepared plaited filter of 10 centimeters diameter; 32 gm. of this filtrate, corresponding to 40 gm. of the tincture, are then further treated as directed under I. for opium.

More than absolutely necessary shaking must be avoided after addition of ammonia, to prevent frothing on the one hand, and emulsification (with the ether) on the other.—Amer. Drugg., Aug. 1887, 143–144; from Pharm. Centralh., 1887, No. 21.

Opium—Cornwall's Modification of Dieterich's Process of Assay.—Prof. Cornwall, at the request of Dr. William K. Newton, the New Jersey State Dairy Commissioner, has made a series of investigations for the purpose of determining the relative value of several of the more recent and best reputed methods of assaying opium and its preparations. The principal object was to ascertain that method which, being at the same time the most convenient and least liable to error on the part of the analyst, would give accurately the proportion of morphine, when the same fell within a reasonable limit above or below the legal standard, rather than to seek a method which would give most accurately the percentage of morphine, *whatever* its amount. Assisted by Mr. L. W. McCay, the author studied the methods of Squibb, of Stillwell, of Dieterich, of Kremel, and that of the U. S. Pharmacopœia, and concludes by recommending the following modification of *Dieterich's* method (see above) as giving the most satisfactory results:

Place 6 grammes of opium in a beaker, add 60 c.c. of water, stir occasionally (breaking up all the lumps) and finally let stand, covered, over night for twelve hours. Filter into a graduated cylinder, wash the residue on the filter until the filtrate and washings amount to 75 c.c. and set this aside. Carefully return the residue to the beaker, stir well with 20 c.c. of water, let stand for ten minutes, and filter through the same filter; repeat the operation twice more, each time with 12 c.c. of water, finally pressing the residue with a glass rod. Evaporate the last three washings in a dish 4 to 6 inches in diameter, on a water-bath below boiling heat. When down to 15 c.c. add the first strong extract, rinsing the cylinder with a little water, and evaporate the whole to exactly 50 c.c., including the water necessary to rinse the solution into the measuring cylinder. Add of normal ammonia, 2 c.c., mix thoroughly and at once filter, as directed in Dieterich's original process. Of this filtrate take a volume corresponding to 4 grammes of opium, add 13 to 14 c.c. of ether, mix by rotating the flask, and then add 4 c.c. of normal ammonia as directed in Dieterich's original process, exactly according to which the assay is now completed.—Amer. Drugg., June 1888, 104.

CRUCIFERÆ.

Cruciferous Seeds—Distribution of Sulphur, Activity of Ferment, etc.—Mr. W. J. Smith has investigated the nature and behavior of the sulphur compounds present in the seeds of cruciferous plants. He find sthat the greater part of the sulphur occurs combined in a glucosidal compound (sinigrin and sinalbin), but a smaller quantity occurs not so combined; in addition there is that which is present as a constituent of albumen. Reckoning the sulphur in the glucoside as "combined," the smaller quantity (excepting that in albumen) as "uncombined," the author obtained the following results:

Sinapis nigra seeds yielded 0.0038 per cent. of "uncombined" sulphur, and 0.5096 per cent. of "combined," or 0.5134 per cent. of the two forms added together, whilst the total sulphur obtained from seeds of the same species was 1.64 per cent. It would appear from this that more than two-thirds of the sulphur present in black mustard seeds is combined in the form of albumen, and less than one-third as myronic acid. These seeds also proved the richest in glucosidal sulphur of all the cruciferous seeds examined; *Cheiranthus annuus* seeds yielded 0.4637 per cent.; *Iberis sp.* seed, 0.4620; *Sinapis alba* seeds, 0.4370; and *Raphanus sativus* seeds yielded 0.4318 per cent. With the germination of the seed the glucoside is gradually broken up. Respecting the rate at which the glucoside is broken up by the accompanying ferment in the presence of water, the author finds the time occupied to vary considerably in different species. The decomposition in the case of *Sinapis alba* and *Lepidium sativum* seeds, powdered and left in contact with water at the ordinary temperature for one or two days, was nearly complete, whilst in the case of *Brassica Napus* seeds, the action had scarcely commenced in the same time; in fact, the ferment of *Brassica Napus* seeds, which acts so slowly upon the glucoside associated with itself, affects the glucoside of *Raphanus sativus* seeds much more energetically, and decomposes the glucoside of black mustard seed—myronate of potassium—as readily as does its own ferment—myrosin. It is therefore inferred by the author that all cruciferous seeds contain one and the same ferment, whilst on the other hand the glucosides of different species vary considerably in respect to their susceptibility to the action of the ferment.—Pharm. Jour. and Trans., June 30, 1888, 1087; from Zeit. Physiol. Chem., xii. 419.

Brassica Iberifolia—A Species with Seeds Resembling White Mustard.—Prof. C. O. Harz describes some seeds which very closely resemble white mustard seeds, for which they were sold, but are characterized by a disagreeable bitter taste. He has identified them to belong to the genus *Brassica;* but they are distinct both from the seeds of *B. Napus*, L., and *B. Rapa*, and he has provisionally named the species from which they are derived, *Brassica iberifolia*, because the young plants obtained by sowing the seeds present an appearance recalling that of species of *Iberis*. The histological characters of these false mustard seeds are described. It gives off the odor of oil of mustard *at once* when mixed with water, true white mustard remaining odorless.—Pharm. Jour. and Trans., Dec. 10, 1887, 478.

Capselia Bursa Pastoris—Alkaloidal Constituent.—Mr. Bombelon announces the discovery in the capsule of the common weed, known as "shepherd's purse," of an alkaloid for which he proposes the name

Bursine.—The plant has been used from time immemorial in domestic practice, without attracting much attention from physicians; but it is now affirmed that its use in domestic practice is justified by its merit, and that it is in effect a valuable agent in the controlling of internal hemorrhages.—Pharm. Era, April 1888, 133; from Pharm. Ztg.

DROSERACEÆ.

Drosera Whittakeri—Isolation and Character of a Volatile Red Coloring Matter.—This plant grows plentifully on the hills near Adelaide, South Australia, and is conspicuous in the spring time by its pretty white flowers, resembling those of oxalis. From the tubers of this plant Mr. Francis extracted, by means of carbon bisulphide, a volatile red coloring matter, which produced on silk beautiful tints with various mordants. Prof. E. H. Rennie has prepared the coloring matter by exhausting the crushed tubers with hot alcohol, distilling the tincture, adding water and subliming the precipitate. The sublimate, by repeated recrystallization from alcohol or acetic acid, was separated into brilliant red plates, $C_{11}H_8O_5$, and into more freely soluble orange-colored needles, $C_{11}H_8O_4$, both being, in all probability, derivatives of methylnaphthaquinone.—Amer. Jour. Pharm., Sept. 1887, 445; from Jour. Chem. Soc., 1887, 371.

CACTACEÆ.

Cactus Grandiflora—Characters of the Starch Granules.—Mrs. Louisa Reed Stowell describes the starch grains of the night-blooming cereus, which are found in great abundance in the plant, as beautiful and characteristic. The grains are generally oval, sometimes spherical, with a well defined, central or excentric nucaleus, around which are many clear and distinct rings. The grains closely resemble potato starch grains, only they are smaller and more regular, both in size and shape.—Pharm. Era, May 1888, 179.

Muscale Buttons—Botanical Source.—The curious drug which has recently been brought to notice under the name of muscale button, is stated by Dr. L. Lewin to be derived from a new species of *anhalonium*, which has been named

Anhalonium Lewini, after Dr. Lewin, by Mr. Henning, of the Botanical Museum of Berlin. The name "anhalonium" was established by Lémaire and utilized by Engelmann for a sub-genus of *mammillaria*, which, having now been merged by Bentham and Hooker in the genus of that name, would properly give the name

Mammillaria Lewini to the new plant. The plant is described as being 1½ cm. high and 3 to 4 cm. broad, with knotty protuberances placed spirally, about 3 to 8 mm. apart, and each covered with a felt-like cap of a yellowish color. The top of the plant is covered with a hairy cushion of a dirty white color, from 1½ to 2½ cm. wide, from which protrude small bell-shaped blossoms about 1 cm. long, with eight outer and twelve inner segments; the former are dark-green on the back, have each a long triangular transparent point, and are 5 mm. long. The petaloid segments are spathulate, blunt, smooth-edged, and about 5 mm. long. The fruit is an oblong berry, 6 mm. long, and contains about fourteen seeds of the size of a mustard seed. The chemical examination of the plant showed it to contain an alkaloid for which Dr. Lewin proposes the name

Anhalonine. It appears also to contain a glucoside, since a crystalline substance extracted from the plant gave the copper reaction for glucose. Physiological experiments made by Dr. Lewin with the watery and alcoholic extracts prove the plant to contain an intensely poisonous substance, which caused a primarily collapsed condition, followed by reflex excitability and tetanic convulsions.—Pharm. Jour. and Trans., April 28, 1888, 902; from Therap. Gaz., April 1888, 232.

CUCURBITACEÆ.

Melon Roots—Presence of an Emetic Principle.—Mr. Heberger, in "Rép. de Pharm," and Mr. Torosciviez, in "Bolletino Farm.," describe a bitter substance, resembling emetine, which may be extracted by means of alcohol from a watery extract of melon root—notably from the roots of wild plants. It forms compact, brownish masses, having a shining fracture; deliquescent; devoid of reaction with acids or alkalies, but soluble in aqueous solutions of the latter, precipitable from such solutions by acids, the precipitate being very little soluble in water. It merely imparts color to ether, but is readily soluble in alcohol, from which it is precipitated by acetate of lead or infusion of galls. It is pungently bitter, and will cause vomiting in doses of nine centigrams.—Amer. Drugg., Nov. 1887, 216.

Cacur—Description and Constituents of the Fruit.—In a former paper (see Proceedings 1887, 162), Dr. G. Armstrong Atkinson had drawn attention to this Kaffir remedy. He now contributes a further description of the fruit and the results of his chemical examination of the same. Cacur is the pepo of Cucumis myriocarpus. The pepoes are caducous, subglobose, and vary in size from small to very large gooseberries, which they resemble in form. When unripe they are green, when mature yellow, and are beset somewhat sparingly with short soft prickles. The South African natives use them principally as an emetic, generally in their green or yellowish-green state. The fruit does not spontaneously expel its contents. Each pepo weighs from 50 to 100, or even 130 grains, the average weight being from 70 to 80 grains. The placentæ are parietal, and bear numerous ovoid, flattened, ex-albuminous, almost white seeds, the testæ of which have a faint bitterness, apparently absorbed from the surrounding pulp. The seeds constitute about 14 or 15 per cent. by weight of the fresh fruit. The pulp is very watery and has a faint cucumber-like odor, and a very bitter taste. The rind is soft and thin, and can only be peeled off with considerable difficulty; its inner layers have the same odor and bitter taste which characterize the pulp. The pulp and rind when dried lose weight very markedly; 1000 grains of rind and pulp from which the seeds had been removed when dried so as to be powdered, weighed only 53 grains. In drying it is necessary to use a low heat, or the active principle will be decomposed. The usual purgative dose employed is one pepo, which when dried and the seeds removed would weigh about three or four grains; two pepoes are employed when emesis is desired. In either case the Kaffirs heat the fruit before using it, probably to render the pulp more watery, as they squirt the contents of the pepoes into their mouths and swallow the expelled material. A considerable quantity of colloid material is in the pulp, and doubtless assists the action of the drug by retarding absorption of the active principle, for this when isolated, as described below, acted less constantly than the fresh pulp. No tannic acid is found in the fruit, but a considerable quantity of chlorophyll is present. The active principle is apparently a neutral substance, which is not a glucoside, and which in accordance with the usual nomenclature might be termed

Myriocarpin.—It has not been obtained in crystalline condition, dissolves readily in water, is soluble in alcohol of all strengths, but less readily in very strong than in weaker alcohol. In ether it dissolves, but not very readily, although sufficiently to allow extraction by its means. In chloroform it is only slightly soluble, and less so in petroleum spirit. When heated on the platinum foil it burns readily with little charring, and leaves no residue.—Pharm. Jour. and Trans., July 2, 1887, 1.

COMBRETACEÆ.

Myrobalanus—Uses for Intestinal Affections, etc.—Dr. Apéry draws attention to the use of myrobalans as a remedy against diarrhœa in Constantinople and the East, the fruits of several species of *Terminalia* being sold by eastern pharmacists in large quantities for this purpose. The doctor's investigations were made upon *M. nigræ s. indicæ*, that variety being "the most energetic and having the greatest vogue." He found no alkaloid, but ascertained the presence of a green oleo-resinous substance which he believes to have an influence upon digestion and bile-secretion. This, together with tannin, which acts upon the intestines, leads the doctor to place the substance among the nutritive tonics and stimulants. A large number of doctors, who were led by him to test the substance, found it very effective in acute diarrhœas of the aged and in infants, as also in intestinal catarrh in tuberculous patients. They also found it efficacious in hemorrhages, hemorrhoids and albuminuria. The doctor believes it to be the best remedy now used in the dysenteries, and acute and chronic choleriform diarrhœas, which decimate the people of the Orient.—Amer. Jour. Pharm., Dec. 1887, 611; from L'Union Pharm., Oct. 1887.

MYRTACEÆ.

Cloves—Proportion of Fixed and Volatile Oil.—Mr. W. F. Swain, to ascertain the proportion of fixed and volatile oil in cloves, examined four samples, two of the entire cloves and two of commercial powdered cloves. The finely powdered drug was exhausted with rhigolene (s.g. 0.625, b. p.

21.1° C.) by maceration. An aliquot portion of the rhigolene was drawn off and evaporated spontaneously, the residue was weighed and then exposed for some time to a temperature of about 90° until free from the odor of cloves, and again weighed, the loss indicating the amount of volatile oil. The results, which agree well with those reported by O. Hesse, are given as follows:

Number.	Residue of Spontaneous Evaporation.	Volatile Oil.	Fixed Oil.
1 whole.	26.00 per cent.	22.0 per cent.	4.00 per cent.
2 "	26.00 "	21.5 " (? Rep.)	3.50 " (? Rep.)
3 powdered.	27.93 "	26.6 "	1.33 "
4 "	27.00 "	25.5 "	1.50 "

By distilling the cloves in a current of steam at 101° to 105° C. 13.25 per cent. of oil was obtained. Six samples of oil examined by the author, had boiling points ranging from 235° to 245° C. He considers the specific gravity of the United States Pharmacopœia (1.050) too high; four samples examined by him having the s. g. respectively of 1.020, 1.012, 1.011 and 1.023.—Pharm. Era, Dec. 1887, 444; from the author's Thesis.

Jambul—Proximate Examination.—Mr. William Elborne has subjected a specimen of "jambul," presented to the Materia Medica Museum of Owen College, by Mr. Thomas Christy, in 1887, to proximate examination. The term "jambul," he states, is now usually understood to apply to the seeds of

Eugenia Jambolana, Lam. (Syzygium Jambolanum, D. C.), a tree which is for the most part a native of tropical America, the West Indies, and the East; but the bark, leaves and fruit are also used in medicine in India. The drug, which has been recommended in the form of powder, as a remedy in diabetes, consisted of the dried kernels of the seeds, which had been cut in halves transversely, apparently to facilitate the process of drying. The ovoid pieces were about the size of large peas, of a dull, earthy-brown color, with a dry earthy fracture, resembling in appearance fragments of pale catechu (Uncaria Gambier), and had a slight aromatic odor. By the results of his examination the author arrived at the following proximate composition of jambul:—Essential oil, a trace; chlorophyll and fat, 0.37; resin soluble in alcohol and ether, 0.30; gallic acid, 1.65; albumin, 1.25; colored extractive soluble in water, 2.70; moisture, 10.00; insoluble residue, 83.73; total=100.00. The ash amounted to 2.5 per cent. of the original substance.—Pharm. Jour. and Trans., May 5, 1888, 921.

Cortex Granati—Percentage of Alkaloid in the Barks of the Root, Stem *and Branches.*—In the last edition of the Germ. Pharm., the barks of the stem and branches of the pomegranate have been made officinal as well as the root bark, the former being equally efficient, though requiring large doses. Mr. Stoeder has determined the percentage of alkaloid in the bark from three different parts: Stem and branch bark, in thin quills, 0.612 per cent.; average quills, 0.350 per cent.; thick quills, 0.498 per cent.; root bark from south of Europe, in thick quills, 1.010 per cent.; shaved root bark from Java, 1.326 per cent.; exfoliated bark from dry thick roots of unknown age, 1.240 per cent.; finely rasped wood from these roots, 0.218 per cent.; so-called "Javanese extract," said to be prepared from fresh root bark, 3.456 per cent. of total alkaloids.—Pharm. Jour and Trans., March 31, 1888, 822; from Pharm. Ztg., March 7, 1888, 136.

Calycanthus Glaucus, Willdenow—*Alkaloidal Constituents of the Seeds.*—Dr. R. G. Eccles announces the discovery of a peculiar alkaloid in the seeds of *Calycanthus glaucus,* locally known in the Cumberland mountains as "bubby," and in other localities as "Carolina allspice," "sweet-scented shrub," etc. During the late war, different parts of the plant were used in the Confederacy as a substitute for cinchona in the cure of intermittent fevers, but among the people residing in the region of the Cumberland mountains, Tennessee, the seeds have the reputation of being poisonous. The process of extracting the alkaloid found most available after trying several, was that of Dr. Lyons. The finely powdered seeds were first macerated for twenty-four hours, with occasional shaking in a mixture of ether, alcohol and ammonia. After allowing the mixture to settle, the clear solution was decanted and evaporated to a small bulk, then stirred or shaken with dilute sulphuric acid and concentrated ether. This was again evaporated until all the ether was gone, when it was filtered. The clear acid solution was neutralized with ammonia shaken up with ether, allowed to settle, the ether decanted from the surface into a porcelain evaporating basin, where it was allowed to spontaneously evaporate and leave the alkaloid. This alkaloid, for several hours after the last of the ether had gone, had a strong, distinct odor of pyridine, so that it was probably contaminated with that volatile alkaloid of tobacco. Dr. Eccles proposes for the new alkaloid the name of

Calycanthine. When it is brought in contact with strong sulphuric acid it gives a yellow color. Strong muriatic acid gives first a yellow, which changes to orange. Nitric acid produces an olive green. A mixture of strong nitric and sulphuric acids when applied forms a dark green that on dilution becomes a beautiful grass green. Strong sulphuric acid and test solution of bichromate of potash gives a rose red. Strong sulphuric acid and sugar in contact with it evolves a lovely pink red. Nearly 2 per cent. of calycanthine was found to exist in the seeds, and about 18 per cent. of a fixed bland oil. No attempt was made to isolate the volatile alkaloid, supposed to be pyridine, owing to the small supply of material to work upon. A second fixed alkaloid appears also to exist, but further experiments are required on this point.—Drugg. Circ., March 1888, 65–66.

ROSACEÆ.

Almonds—Localization of Amygdalin and Emulsin.—It has long been supposed that amygdalin and emulsin must exist either in different cells in the almond or in different parts of the seed. Mr. Johannen has now completed experiments which prove the latter supposition to be correct. He finds that the integument of the seed contains neither emulsin nor amygdalin. The emulsin is localized in the asile part of the embryo (radicle and plumule) and in the vascular bundles of the cotyledons, while the amygdalin occurs in the parenchyma of the cotyledons of the bitter almond only.—Pharm. Jour. and Trans., March 31, 1888, 825; from Ann. der Ic. Nat. (Bot.), 1888, 126.

Prunus Lauro-Cerasus.—Proper variety and time for collection for making *Aqua Lauro-cerasi*, which see under "Pharmacy."

Wild Cherry Bark—Constituents.—Messrs. Fred. B. Power and Henry Weimar have made experiments to determine whether, as is generally assumed, the production of volatile oil and hydrocyanic acid is due to the presence of amygdalin and emulsin. Also, what is the character of the bitter principle, by some assumed to be phloridzin, by others undecomposed amygdalin. The authors summarize the results of their investigations, which they, however, only regard as preliminary to a more complete study of the subject, as follows:

1. That wild cherry bark does not contain crystallizable amygdalin, but an analogous substance, possessing a somewhat bitter taste, and as yet only obtainable in an amorphous, extract-like form. It appears to be more closely related to the so-called *lauro-cerasin* of cherry-laurel leaves.

2. That the ferment contained in the bark is not identical with the emulsin or synaptase of almonds, or at least cannot be isolated by an analogous process.

3. A fluorescent principle exists in the bark, which crystallizes in colorless needles, and has the characters of a glucoside. This substance, the elementary composition and chemical characters of which will be subject of future determination, appears to represent the peculiar bitter principle of the bark.—Pharm. Rundschau, Sept. 1887, 203–205.

Quillaja Bark—Active Constituents and Therapeutic Value.—Prof. R. Kobert had already ascertained some years ago (see Proceedings 1886, 639) that the commercial saponin did not represent the full therapeutic power of soap bark, or of whatever other substance was used for its preparation. It had been customary to designate as saponin the precipitate which was produced by adding alcohol to a cold aqueous infusion of the drug, but he found that the filtrate, which had been heretofore rejected, contained a very active substance, and he succeeded in finding a method by which the two most active substances contained in soap bark, namely, *quillajic acid* and *sapotoxin*, could be separated from each other. Mr. Dimitrij Pachorukow has now investigated the subject, devoting his experiments principally to

Sapotoxin.—This substance is contained in the bark only in very small percentage, and is exceedingly powerful. It is remarkable through its solvent action upon the red corpuscles of the blood, dissolving them completely even in dilution of 1 in 10,000. The same property, though in a much lesser degree, belongs to quillajic acid and to commercial saponin. Fortunately, however, this takes place only when the sapotoxin, etc., is introduced directly into the circulation (by injection). None of these substances are absorbed either by the stomach or intestines, the only effect which is produced, even by relatively large doses, being a local irritation, with occasional vomiting. But when actually absorbed, or when injected (in concentrated solution) into any involuntary muscle, it diminishes or entirely destroys its vitality. It is also a poison, both for the motory and the sensory nerves, not alone in their terminations, but also in their main branches. In spite of the apparently energetic and toxic action of sapotoxin, the author agrees with Prof. Kobert that the employment of quillaja bark is not only theoretically indicated as an expectorant, but advisable on practical grounds also in place of senega, its valuable constituents being present not only in more constant, but in nearly five times greater quantity than in the latter and hitherto more popular drug.—Amer. Drugg., April 1888, 72.

LEGUMINOSÆ.

Cassia Marilandica—Proximate Analysis of the Leaves.—Mr. Hermann J. M. Schroeter describes the leaves of *Cassia marilandica* as they occur in commerce under the name of "American Senna." It consists of leaflets varying in length from one to two inches, and in breadth from one-quarter to one-half inch. In shape they are oval-oblong or oblong-lanceolate, entire or broken; of a pale green color, a feeble odor, and a bitterish sweet, nauseous taste, resembling that of Alexandria or East India senna somewhat. It is commonly found in the shops in the form of oblong or square cakes, which usually consist of leaflets, petioles and flowers compressed together in a compact form. The author subjected the drug to proximate examination according to the scheme recommended by Dragendorff, the following being a summary of his results:

Soluble in *petroleum spirit:*		
Fixed oil	3.200	
Volatile oil	.040	
Wax, soluble in chloroform	.300	
Insoluble residue—caoutchouc	.100	
		3.640

Soluble in *stronger ether:*		
Extractive soluble in H_2O—trace of tannin	.030	
Extractive soluble in alcohol (chlorophyll)	1.980	
Insol. residue (decomposed chlorophyll)	.860	
		2.870
Soluble in *absolute alcohol:*		
Tannin	.625	
Glucose	.558	
Other extractive and coloring matter, soluble in H_2O.	4.867	
Phlobaphenes, soluble in NH_4OH.	1.350	
		7.400
Soluble in *distilled water:*		
Mucilage.	7.740	
Dextrin and allied carbohydrates	2.760	
Albumin.	.240	
Glucose	5.230	
Saccharose	3.245	
Organic acids and allied substances	.200	
Undetermined—active principle, coloring matter, etc	.825	
		20.240
Soluble in *caustic soda solution* (0.2 per cent.):		
Albuminoids	3.200	
Extractive, not ppt. by acetic acid and alcohol	5.180	
		8.380
Soluble in *dilute hydrochloric acid* (1 p. c.):		
Pararabin	.960	
Starch	5.270	
Oxalate of calcium.	.140	
Albuminoids and extractive matter.	2.350	
		8.720
Lignin	1.820	1.820
Hydrocellulose, etc	2.760	2.760
Cellulose.	23.270	23.270
Moisture.	8.900	8.900
Ash	6.800	6.800
Loss	5.200	5.200
	100.000	100.000

A series of independent experiments were made to determine the character of the

Active Principle.—This was found to be a complex body, responding to cathartic acid, both in properties and in action. It was obtained by the following process: 250 grams of the powdered drug were digested with water at a moderate temperature, the decoction obtained concentrated to a syrup, and the mucilage, etc., precipitated with alcohol. The solution being again concentrated, and several volumes of absolute alcohol added, the crude cathartates were obtained. The albumen was precipitated from this by dissolving in water and adding a few drops of HCl. The precipitate obtained, on addition of more HCl, was treated with hot 60 per cent. alcohol. From this solution the purified cathartic acid was obtained by precipitation with ether. The active principle so obtained is insoluble in water, absolute alcohol, chloroform, and ether, soluble in warm diluted alcohol, is of a brownish-black color, amorphous, dissolves in alkalies with dark-brown color, and is reprecipitated by acids. Tannin, antimonial salts, yellow and red prussiates, have no effect upon it. Color tests, with strong acids, were following: With H_2SO_4, green brown; H_2SO_4 and $K_2Cr_2O_7$, greenish black; with HNO_3 and HCl, no change. Taken internally the substance produced a decided cathartic effect, and the author believes it to correspond very closely to the cathartic acid of Alexandria senna, the inferior effect of American senna being due solely to the smaller percentage of this principle contained in it. A

Yellow Coloring Matter found in the American drug was also examined, and is believed to be identical with the *chrysophanic acid* found in the Alexandria senna.—Amer. Jour. Pharm., May 1888, 231–235.

Cassia Nictitans, Lin.—*Analysis.*—Mr. Charles S. Gallaher has subjected this plant to proximate examination. The plant is known as wild sensitive plant, and grows abundantly in the neighborhood of Philadelphia, where it was collected for analysis, then dried and reduced to powder No. 80. The air-dry powder on being heated to between 100° and 110° C., lost 3.7 per cent. of moisture, and yielded 4.8 per cent. of ash. Petroleum benzin extracted a minute quantity of volatile oil, and 0.08 per cent of waxy matter melting at 58° C. Ether took up from the powder 5.6 per cent. of resinous matter and chlorophyll, tests for glucosides and alkaloids giving negative results. The alcoholic extract on being treated with water, left 5.78 per cent. of resinous matter undissolved; the aqueous solution yielded nothing to petroleum spirit, benzol and chloroform; tested with gelatin and ferric salt, the presence of tannin was revealed, and this was estimated by precipitation with copper acetate and ignition, the result being 7.44 per cent. of tannin. The aqueous extract weighed 17.28 per cent.; this was found to be free from glucose, but contained another sugar, dextrin, and gum; cathartic acid could not be prepared from it, but the powder was ascertained to have a laxative effect and to produce griping. Tests applied for starch gave negative results; albumin, pararabin, calcium oxalate, lignin and cellulose were present. A larger quantity of the fresh plant was distilled with water in the presence of lime, but no volatile alkaloid was obtained. Another portion distilled with dilute sulphuric acid yielded a distillate having merely a faint acid reaction.—Amer. Jour. Pharm., June 1888, 280; from the author's Thesis.

Acacia delibrata—Occurrence of Saponin in the Pods.—Dr. Bancroft calls attention to the occurrence of a saponin in the pods of *Acacia delibrata*, a plant growing near Brisbane, Queensland. The saponin has a disagreeable taste, is soluble both in water and in alcohol, and was found to act as an irritant poison.—Pharm, Journ. and Trans., Oct. 1, 1887, 278; from Austral. Jour. Pharm., 1887, 104.

Gum Arabic—Origin in the Trunk of the Tree.—Mr. F. von Höhnel has had opportunity to examine a specimen of gum of *Acacia Verek* attached to a portion of the stem about 13 to 14 cm. long and 4½cm. in thickness. A microscopic section of the stem at the point at which the gum had exuded showed only a very small cavity, which gave no evidence of destructive metamorphosis of the cell walls. The author therefore concludes that the gum is not formed, as in tragacanth, from the cell wall, but from the cell contents, and mentions the absence of cellular structure in gum arabic as a further confirmation of his view.—Pharm. Jour. and Trans., June 30, 1888, 1089; from Berichte, 1888, 156.

Gum Arabic—Commercial Substitute.—Prof. E. B. Stuart draws attention to an artificial gum that has recently been offered in the Chicago market as a substitute for gum arabic. The substance has the appearace of "granulated" gum arabic, except that it is more nearly colorless. Its taste is something like that of gum arabic, but with a stronger suggestion of sweetness. To test it practically, emulsions of various oils were made with this artificial gum and compared with duplicates of the natural gum. In all instances the artificial gum afforded as satisfactory an emulsion as the natural, and in the instance of cod liver oil it appeared even to be superior, the emulsion not separating as easily. Subjected to nearer examination, the author obtained results which warrant him in the belief that this artificial gum is prepared by adding a certain amount of gum arabic to a very pure dextrin in solution, which is then probably filtered and evaporated in a vacuum to the proper density, and either scaled or granulated. He can, therefore, see no objections to its use as a substitute for the natural gum.—West. Drugg., April 1888, 119.

Gum Arabic—Substitutes.—The high price of gum arabic and its growing scarcity, makes it a subject of great interest and industrial value to determine some absolute substitute, the source of which is not subject to contingences such as affect the supply of gum arabic. In this direction the experiments of Scheibler, who proposes arabinic acid obtained from sugar beets, are among the most important. Sugar beets contain

Arabinic Acid in the insoluble modification as metarabinic acid, and must therefore be subjected to a peculiar treatment in order to convert the insoluble modification into the soluble. This is obtained by expressing the beet pulp (without adding water) to free it from its juice, which is worked up for sugar in the usual way, and only the expressed residue is used. It will be necessary to deprive the pulp of all its juice without the addition of water, which would swell the metarabin of the cellular tissue and dissolve it. For that reason cold alcohol of 86 to 90 degrees

(Tralles) is used for extracting the press leavings, by allowing them to macerate for several hours in it, after which time the alcohol is expressed and the maceration repeated. After the second expression the residue is transferred to cold water, and heated for some time, till all the alcohol has been evaporated and the metarabin is swelled, when sufficient milk of lime is added to give a strong alkaline reaction. After heating in a water-bath, arabinate of lime is formed, which dissolves; and, after separating the solution from the insoluble portion, a current of carbonic acid gas is introduced in order to remove any excess of lime; finally it is transferred to a filter, the filtrate evaporated to a smaller bulk and again filtered. By supersaturating the syrupy liquid with acetic acid, arabin (or arabinic acid) can be precipitated with alcohol. As far as the chief component of gum arabic is concerned, the work of the chemist has been done as detailed above; it now only remains to provide for the lime and magnesia salts which are to be found in every natural gum, and finally, to find proper processes for decolorizing the artificial gum.—Drugg. Circ., June 1888, 123–124; from Zeitsch. Oest. Apoth. Ver.

Brazilian Gum—A Substitute for Gum Arabic.—Attention is drawn in "Pharm. Jour. and Trans.," (Jan. 28, 1888, 263) to a recent shipment of about fifty tons of a gum from Para to London, which appears to be well suited as a substitute for gum arabic for technical purposes. The sample presented to the Museum of the Pharmaceutical Society is quite soluble in water and forms a good adhesive mucilage; but its brownish color makes it unsuitable for pharmaceutical purposes.

Indian Gums—Substitutes for Gum Arabic.—Mr. A. Mander describes several varieties of gum which have recently been imported into England from the East Indies:

(1) *Glassy Amrad Gum.*—A dark gum consisting of more or less rounded, and some stalactitic pieces, with smooth shining surface and free from internal cracks. Color varying from dark-brown to pale yellow.

(2) *East India Amrad Gum.*—A dark brittle gum of a reddish tint, composed chiefly of transparent angular fragments with a few rounded masses having a conchoidal fracture.

(3) *Pale Amrad Gum.*—This somewhat resembles "gum acacia sorts" being in broken angular pieces or small tears, and these more or less cracked internally—some pieces may be noticed having an opaline surface.

(4) *Oomra Whatti Gum.*—A dark gum, in irregularly shaped and stalactiform pieces, clear internally but dull surface; color from reddish to pale yellow.

(5) *Ghatti Gum.*—A pale gum consisting of rounded or vermiform pieces of varying size, clear internally, but dull and roughened on the

surface, apparently caused by shrinkage in drying; from brownish-yellow to perfectly colorless and transparent. More carelessly picked than previous specimens, with woody and other foreign matter adhering.

The author prepared mucilage with these different gums according to the B. P. directions for making mucil. acaciæ. That from (1) was dark yellowish-brown, very viscid (viscosity 2. acacia=1), and strongly adhesive; (2) had the same color as 1, but viscosity was only .51 (acacia=1): (3) mucilage pale-yellow, somewhat gelatinous, viscosity only .156 (acacia=1); (4) mucilage darker than 1, viscosity 1.8; (5) mucilage a pale yellowish-brown semi-solid mass. The behavior with chemical reagents of these different gums is summarized by the author as follows:

	Glassy Amrad.	East India Amrad.	Pale Amrad.	Oomra Whatti.	Ghatti.
Basic lead acetate	Slight ppt., not gelatinous.	Brownish opaque thick jelly.	Curdy opaque ppt.	No ppt.	Translucent gelatinous ppt.
Neutral lead acetate . . .	. . . . . .	. . . . . .	Slight ppt.	. . . .	
Ammonium oxalate . . .	White ppt.	Slightly colored ppt.	White ppt.	White ppt.	Slight ppt.
Borax	Gelatinized.	. . . . . .	. . . . . .	Gelatinized.	Gelatinized.
Ferric chloride	Brownish color.	Slight darkening.	Curdy white ppt.	Slight darkening.	
Mercuric chloride . . .	. . . . . .	. . . . . .	Slight ppt.	Slight ppt.	
Alcohol	Ppt.	Ppt.	Ppt.	Ppt.	Ppt.

The oomra whatti and amrad gums cannot be said to have much value in practical pharmacy, though they may be well adapted for the chief uses to which the inferior qualities of gum arabic were formerly exclusively put. They contain little or no astringent principles to affect the mordants in calico printing, and for strong adhesive mucilages where color is immaterial "glassy amrad" and "oomra" seem to be very suitable. Concerning "ghatti" a little more may be said.

Another supply of mucilage was made according to the formula:

Gum ghatti	1 ounce.
Distilled water	3 fluid ouces.

On straining, a few grains were separated which had swollen to a translucent jelly, and these remained undissolved when treated with more water. The mucilage thus obtained is scarcely as bright as that from picked gum arabic, but quite equal to that given by ordinary good samples as to color, and at the same time more viscid. It is tasteless, inodorous, and of superior adhesive properties to mucil. acaciæ. The emulsifying power was tried with olive oil, this being selected in preference to almond or castor oils as a more crucial test. Several emulsions were made with varying proportions of oil and ghatti mucilage as above, and compared with others made with the same amounts of oil and acacia mucilage prepared from selected gum.

No. 1.—Ghatti mucilage 1, olive oil 1, distilled water 62.
No. 2.—Acacia “ 1, “ 1, “ “ 62.
No. 3.—Ghatti “ 1, “ 2, “ “ 61.
No. 4.—Acacia “ 1, “ 2. “ “ 61.

The emulsions afforded by ghatti mucilage are, as regards consistence, etc., quite equal to those by acacia, but preferable as to color, being of almost pure snowy whiteness. On microscopical examination the oil particles in the emulsion made with ghatti and two parts of oil appear as nearly as possible identical in size with those given by acacia and one part, or half the quantity of oil. After standing fifteen days the "ghatti" emulsions showed no separation of oil, and since the mucilage was made with double the proportion of water used for acacia, it must be acknowledged that the emulsive power of the gum is very remarkable.—Pharm. Jour. and Trans., April 14, 1888, 876–878.

Licorice Root—Anatomical Structure, etc.—Messrs. A. Tschirch and J. Holfert communicate a very complete microscopic description—accompanied by a number of cuts—of the anatomical structure of the roots and rhizome of *Glycyrrhiza glabra*. They also briefly describe the characters and distinctions of the different commercial sorts, embracing Spanish, peeled and unpeeled, Russian, Caucasian, Chinese, and African licorice roots.—Arch. d. Pharm., June 1, 1888, 473–488.

Balsam Peru—Test for Detecting Benzoin and Storax.—Messrs. Gehe & Co., find that a test proposed by Denner at a recent meeting of naturalists at Wiesbaden, for the detection of benzoin and storax in balsam of Peru, is very valuable, but may be advantageously shortened in the following manner: Mix 5 gm. of balsam of Peru, 5 gm. of solution of soda (containing 15 per cent. NaHO), and 10 gm. of water, in a test tube. Shake the mixture with two successive portions of 15 gm. of ether, and decant the ether each time as far as possible. Heat the residue to boiling and acidulate it with hydrochloric acid. Then add cold water, and remove the resin which separates from the liquid. Dissolve this resin in 3 gm. of solution of soda (15 per cent.), dilute with 20 gm. of water, heat to boiling, and precipitate with solution of chloride of barium. Transfer the precipitate to a filter, drain, dry it on a water bath, and extract it with alcohol, Evaporate the alcoholic solution, dissolve the residue with concentrated sulphuric acid, add chloroform and shake. If benzoin or storax had been added to the balsam, the chloroform will assume a violet to blue color. Even small quantities of the adulterants are still recognized by the test.—Amer. Drugg., June 1888, 106; from Gehe & Co's. Handelsbericht for April 1888.

Copaiba—Origin.—Professor Tschirch considers that copaiba origi-

AMERICAN PHARMACEUTICAL ASSOCIATION.

SECTION ON SCIENTIFIC PAPERS.

Thirty-Seventh Annual Meeting, to be held in San Francisco, commencing Monday, June 24, 1889.

FELLOW MEMBERS: The undersigned committee respectfully calls your attention to the approaching annual meeting of the American Pharmaceutical Association, and urges upon each and every member to contribute in some way toward the success of this meeting. Every one engaged in the practice of pharmacy owes a debt to his calling, and just in proportion to the fulfillment of this obligation does pharmacy assume her position above the mere trades. If we are unwilling to contribute at least a small share toward the general fund of knowledge, we certainly forfeit all right to be classed as members of a liberal profession, and are nothing more nor less than storekeepers.

Your committee is well aware that many claim to have no time to spare to even note their experiences, and others urge a lack of ability for literary work. To such we would suggest that no elaborate essays or intricate examinations are expected of them. Every druggist must admit that there is not a single person engaged in the practice of pharmacy but that could, if he would, from his every-day experience (with but little additional labor), add something of value to pharmacy, and thereby promote the general welfare.

We are not unmindful of the claims upon our time, of State and other local associations; nor is the National Association in any degree antagonistic to these; at the same time, matters of general interest or national importance, certainly come more properly before the National Association, which unquestionably merits the best of our work.

In this connection we desire to call especial attention to the change in the management adopted at the Cincinnati meeting, dividing the interests of the Association into Sections, and making a systematic apportionment of time to each, thereby enabling your Committee on Scientific Papers to give the assurance that every contribution will be properly presented to the meeting, and an opportunity offered for a free discussion of the points made, even though there be double as many papers as at any previous meeting.

In presenting the subjoined list of queries, it is not intended to confine the subjects of inquiry within its narrow limits. We ask reports upon all of these, and besides, volunteer papers upon such subjects as individual members may select, agreeable to their own tastes, working in their special line or favorite department. Particular attention is called to the approaching time for the next revision of the U. S. Pharmacopœia, which offers a wide and most important field for investigation.

We are pleased to state that a number of the queries have already been accepted (those marked with an asterisk [*]), which fact, however, need not deter others from writing on the same subjects, and especially upon such as queries, 2, 3, 21, etc., which will be advantageously considered from different points of observation.

Attention is called to the *Centennial Fund*, the interest of which is to be used for defraying the expenses of suitable investigations (see Chap. VII of By-Laws of Council). Should you desire to avail yourself of this fund, please make application to the Permanent Secretary, Prof. J. M. Maisch.

To encourage investigation, the "Ebert Prize is offered for the best essay or written contribution containing an original investigation of a medicinal substance, determining new properties, or containing other meritorious contributions to knowledge; or for improved methods of determined merit for the preparation of chemical or pharmacal products; provided, that in case no one of the essays is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected and the sum added to the fund" (Proceedings 1873).

Papers, when completed, should be forwarded immediately to the chairman of this committee, and every paper should be in his hands by June 1st, to enable him to get them printed before the meeting. By the experience of the last two annual meetings, it has been proven very desirable to have copies of the papers in the hands of those in attendance, whilst being read, that they may better follow the reader, and note such points as they desire to raise when the subject is open for discussion.

EMLEN PAINTER, Chairman,
S. W. cor. Broadway and 34th St., New York.
R. G. ECCLES,
H. M. WHELPLEY, Secretary,
Committee on Scientific Papers.

LIST OF QUERIES.

THIRTY-SEVENTH ANNUAL MEETING TO BE HELD IN SAN FRANCISCO, CAL., 1889.

1. A Pharmaceutical comparison of the extracts of Acacia Catechu and Uncaria Gambier. As "Catechu" the U. S. P. directs the extract of Acacia Catechu; the Br. P. directs extracts of Uncaria Gambier. Which of the two is preferable for pharmaceutical uses?

2. Is it feasible to improve the syrups in the Pharmacopœia? An essay on the subject is desired, with practical suggestions for improvement, particularly for Syrupus Aurantii Corticis, Syr. Tolutana, Syr. Zingiberis, Syr. Rhei, Syr. Rhei Aromaticus, Syr. Sarsaparillæ Compositus.

3. Is it desirable and practicable to abolish the present Tinctures and Fluid Extracts of the Pharmacopœia, and to establish in their stead a single class of preparations styled inctures, of uniform strength, and of 50 per cent. of drug value, or of such proportion as can be exhausted by the combined process of maceration and percolation without subsequent concentration? *

4. Is it not advisable to drop from the United States Pharmacopœia all compound galenical preparations?

5. Further researches on the alkaloids of Gelsemium. Is the alkaloid *Gelsemine* the only constituent of the drug having medicinal value? *

6. What is the quality of Belladonna Root as obtained through reliable dealers? How does it compare with Belladonna Leaves in regard to uniformity in strength? *

7. What is the natural combination or association of the alkaloids and resinous constituents of Veratrum Viride?

8. Further researches on the crystalline precipitate that occurs in Tincture of White Agaric.*

9. Do pharmacists generally follow the Pharmacopœia in the preparation of Tincture of Nux Vomica? What bearing, if any, has the result of this inquiry upon introducing into the Pharmacopœia assay methods in other processes? *

10. What is the influence of heat and moisture as a preparatory step in the extraction of some drugs? *

11. It has been proposed to introdoce into the next United States Pharmacopœia processes of assay for such drugs and their preparations (besides those already thus provided for in the last revision), as contain important active principles which may be estimated quantitatively. It being important that the method of assay shall be as simple, concise, and as free from refined technicalities as possible, it is desired that the text for working processes of a series of these drugs be drawn up so that it may be thoroughly tested in advance of the appearance of the work.

12. Colchicum seed contains a fixed oil which renders its alcoholic preparations un-

sightly. Has this oil any medicinal value? If not, can it be removed without detriment to the preparation? *

13. What amount of the drug sold in commerce under the name of Berberis Aquifolium is of the other species of Berberis. *i. e.*, B. Repens and B. Nervosa?

14. What is the comparative value of Yerba Santa, Licorice and Saccharin in masking the taste of Quinine and other bitter substances?

15. It has been asserted that under the name "Hungarian Daisies" an adulterant for Insect Powder has been introduced. To what extent is this adulterant imported?

16. It has been observed that Fluid Extract of Belladonna is a neutral solution when first made, and that by age it acquires an acid reaction. What is the cause of this change, and does it affect the medicinal value of the preparation?

17. Examine some of the more important solid extracts of the market for mineral impurities, chiefly copper, and ascertain the conditions under which this metal may be most accurately estimated, in such cases, by electrolysis.

18. What is the nature of the change which solutions of Morphine salts (notably the muriate) undergo by time, and what is the crystalline body which makes its appearance?

19. How many new albumen products result in pepsin digestion? Can these products be isolated; and by what tests can they be distinguished?

20. Gelatin has been suggested as a superior emulsifying agent for Cod-liver Oil. Can this be verified? If so, give working formula for a permanent emulsion. *

21. Has Syrup of Dextrin a use in pharmacy? Give formula, and instances where it could to advantage replace Cane Sugar Syrup. *

22. A further consideration of Maize Oil. Can it be advantageously employed in pharmacy in place of Cotton Seed Oil or other oils now in use? *

23. What are the present sources of Commercial Oil of Wintergreen? and what proportion is derived from each source? Is the synthetical product ever sold as natural oil? To what extent does the artificial Oil of Wintergreen replace the natural oil or oil of birch?

24. Essential Oils are said to be adulterated before reaching the dispenser, to a greater extent than any other medicinal products, and also to materially differ in quality even when pure. What are the best methods of detecting adulterations, and of determining the quality of the principal volatile oils? *

25. It has been stated by competent authorities, that the characteristics aud physical or chemical properties ascribed to many essential oils by the U. S. or other pharmacopœias, often do not fit the commercial oils, even when the latter are known to be genuine. It is desired that as many of the more important officinal essential oils as possible be carefully reëxamined, account being taken of all facts that may be rendered available by those who manufacture and handle these products on a large scale.

26. Complaints have been made that several brands of terebene offered in the market differ but little in physical or medicinal properties from oil of turpentine. Examine all available brands as to their optical properties.

27. Is the reaction of Methozin (Antipyrin) with Spirit of Nitrous Ether, owing to

the free acid present in the spirit? It is said not to react (with coloration at least) with some specimens of Spirit of Nitrous Ether.*

28. What directions should be given in the Pharmacopœias for the care and preservation of Spirit of Nitrous Ether?

29. The officinal method of assaying Spirit of Nitrous Ether having been shown to be unsatisfactory, and better methods having been announced during the last few years, it is very desirable to have drawn up an improved assay process, giving all the details as concisely as possible, but not referring the reader to other works to be consulted.*

30. Acetic Ether of the market varies greatly as to strength and properties. It is desired that experiments be made to ascertain the limit of range of absolute Acetic Ether, and also to determine the nature and proportion of the other constituents.

31. What are the products of the reaction in preparing Decolorized Tincture of Iodine of the National Formulary? To what substance is the peculiar alliaceous odor due which develops in it on standing?

32. Sulphonal, which has acquired some reputation as an efficient hypnotic, is pharmaceutically very intractable. It is desired that working formulæ be devised which will enable its use, if possible, in solution, but at all events in such a manner that absorption will take place more rapidly.

33. A series of very soluble compounds of caffeine have been announced under names similar to those applied to regular double salts, for instance, sodio-cinnamate of caffeine, sodio-benzoate of caffeine, sodio-salicylate of caffeine. Can it be shown whether true double salts of this composition can be prepared? Or can some light be thrown on their constitution?

34. Hypophosphorous Acid has been found to greatly retard, and under certain conditions to entirely prevent the oxidation of ferrous salts to ferric, even when only minute quantities of the acid are present. It is desirable to ascertain: 1. What role the acid bears in this preservative action. 2. What are the limits as to the quantity of acid which will preserve ferrous solutions, and as to the time during which such preservation extends. 3. What becomes of the hypophosphorous acid? 4. Will hypophosphites answer the same purpose? 5. May this preservative agent be used in the case of other chemicals besides ferrous salts?*

35. Solution of Chloride of Iron is declared by the United States Pharmacopœia, when prepared by the officinal process, to have the spec. grav., 1.405. Other authorities state that this figure is scarcely ever reached. Is it possible to so reconstruct the formula that all doubt as to the amount of iron in solution may be eliminated?

36. It has been observed in preparing the Syrup of Citro-iodide of Iron according to the National Formulary, that the solution does not turn green upon adding the Potassium Citrate and Iodine, but after being mixed with the sugar and exposed to the sunlight for a few hours the reddish color is gradually changed to the characteristic green color, which seems to be permanent. What is the reaction that takes place?

37. Should a working formula for "Green Soap" be introduced into the Pharmacopœia, similar to that of the German Pharmacopœia, in order to insure more uniformity?

38. An essay on Corrosive Sublimate as a disinfectant is desired. Do the advantages derived from its use outweigh the disadvantages?

39. In what quantity and to what extent is arsenic present in wall paper? Is the public health thereby in any degree affected?

40. Give a glossary of practically obsolete botanical, chemical and pharmaceutical terms, but such as may still be occasionally met with by pharmacists.

41. Cannot the nomenclature of the Pharmacopœia be improved? A paper is desired on "Pharmacopœial Nomenclature."*

42. What system of weights and measures should be adopted in the next revision of the U. S. Pharmacopœia?

43. With what degree of accuracy are powders ordinarily divided in dispensing?*

44. Do Pharmacists give the public all the protection it should have at their hands, in the way of adulterated, poor and dangerous drugs and preparations?

45. An essay on "How to conduct Quiz Classes" in our pharmaceutical educational institutions?*

46. Is it practical or desirable to have a recognition and interchange of pharmacy certificates by the different State Boards of Pharmacy? and if so, how can this end be accomplished?

47. What should be the true aim of Boards of Pharmacy in their examinations, and how can it be best accomplished?

48. What is the policy of the patent and trade-mark laws in relation to science of medicine and the useful arts of pharmacy and therapy?*

49. It has been asserted on good authority that inventions and discoveries not patented are public property, and that any attempt on the part of an inventor to monopolize his invention, except by means of and the requirements imposed by the patent laws, is an usurpation of public rights. How can the pharmacist be taught that it is his privilege and prerogative to manufacture any and all medicines not patented, and to call them by the names known to the public, all claims to the contrary notwithstanding?

50. Under the present code of ethics of the American Medical Associatiou, can Pharmacists be given creditable recognition as a section in this organization?

51. The membership of the American Pharmaceutical Association is said to comprise but a small proportion of the qualified druggists of America, and even less than five per cent. of the whole number of those engaged in the drug business. What means can be devised to bring about a more liberal representation?

52. Is the college training in Pharmacy after two years practical experience better for the student than the reverse, viz.: theoretical first and practical afterwards?*

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* Accepted.

nates in the trunk of the tree by the destructive metamorphosis of the walls of the vessels and then the contiguous wood cells, cavities being thus formed which gradually enlarge. This metamorphosis is seen to take place in the inner wood of twigs of only a year old.—Pharm. Jour. and Trans., Oct. 1, 1887, 278.

Logwood—Suitable Kind for Medicinal Use.—Mr. Louis Siebold, in a paper read before the British Pharmaceutical Conference, endeavors to solve the questions; 1, as to the kind of logwood most suitable as a medicinal agent, and 2, what is the nature and condition in which this wood should be employed? Respecting the first question, he expresses the opinion very decidedly, that the woods of Campeachy or Honduras ought to be used in preference to those of San Domingo or Jamaica, on account of their greater richness in hæmatoxylin, the astringent principle. As regards the nature and condition in which this wood ought to be employed, he is not so certain. The ground or chipped wood of commerce is not the unaltered wood obtained from the logs as imported, but it has been subjected to a process of fermentation, involving considerable changes in its chemical composition. The chipped or ground wood is thoroughly impregnated with water, and exposed in large heaps with frequent turning to the air for weeks, during which the pale color of the original wood changes to a deep red, owing to the conversion of the "hæmatoxylin," into its oxidation product "hæmatein." By this process, which consumes from 4 to 6 weeks for completion, some of the chips assume a greenish cantharidin-like hue, and the wood is in the best condition for technical purposes. The unfermented article has, besides the astringency of the fermented article, a sweetish taste, which is lacking in the fermented wood. The author's experience points to the greater efficiency of the unfermented wood, and he thinks that this kind should be employed for making the decoction and extract, both of which are apparently less efficient and palatable when made from the commercial (fermented) wood. An efficient preparation is a fluid extract (which see) made with water.—Yearbook of Pharm., 1887, 548–550.

Logwood—Condition Suitable as Reagent.—Mr. Louis Siebold draws attention to the observation that as a color reagent for analytical purposes, the fermented logwood (see above) is superior to the unfermented or natural wood. He finds that a litre of water containing 1 mgr. of such salts as sulphates of copper, alum, or stannous chloride, gives striking color reactions with a fresh tincture of the fermented wood. Delicate but inferior reactions are obtained with lead and iron.—Yearbook of Pharm., 1887, 555–556.

Trigonella Foenum-græcum—Alkaloidal Constituents of the Seeds.—Mr. E. Jahns has determined fœnugreek seeds to contain two alkaloidal constituents, the one, *choline*, amounting to about 0.05 per cent., the other peculiar to the drug, and named by the author

Trigonelline. It is present to the amount of 0.07 to 0.13 per cent., constitutes colorless, flat prisms, having a faint saline taste, somewhat hygroscopic, easily soluble in water, sparingly soluble in cold alcohol, readily in hot alcohol, insoluble in ether, chloroform and benzol. Its solutions react neutral, but it gives the usual alkaloid reactions, and forms well-defined crystalline salts, the reactions of which are acid. The hydrochlorate, nitrate, sulphate, platino- and auro-chloride, have been prepared and are described. The ultimate composition of the new alkaloid conforms to the formula $C_7H_7NO_2+H_2O$. Trigonellin does not possess any marked physiological action. Any action of the seed must therefore be attributed to the choline present, which in large does at least, has poisonous action similar to muscarine.—Arch. d. Pharm., Nov. 2, 1887, 985–997.

Erythrophlœum Guineense, G. Don—*Historical Notes, etc.*—The discovery by Lewin of the anæsthetic properties of the active constituent of the bark of *Erythrophlœum guiniense* (*E. judiciale*, Proct. Jr.; *Fillæa judicialis*, Guill. et Perr.; *Mavia judicialis*, Bertol.), has led to numerous reviews of the information that has been given from time to time respecting the plant itself, the bark—known as Sassy, or Mançône bark—and the ordeal poison prepared from it. A. Corre and L. Lejanne, in 1876, described the uses of sassy bark, and state that when it is chewed it at first tastes bitter and then strongly acrid, but afterwards the sensibility is strongly reduced. The local anæsthetic characters of the bark were therefore known before the discovery of Lewin. A comprehensive description of sassy bark is given in the "Commentar zur oesterreichischen Pharmacopœia," (1880) p. 276, by Professor Vogel; while in the "Résumé de la Matière Médicale et Toxicologique Coloniale," by Messrs. Corre and Lejanne, the plant, fruits, seeds, etc., are carefully illustrated.—Pharm. Post, Feb. 26, 1888, 134–135.

Gleditschia Triacanthos, Lin.—*Absence of Alkaloidal Constituent.*—The alleged discovery of an active alkaloid, resembling cocaine in its action, and named at first *stenocarpine*, then *gleditschine*, has induced Prof. Karl Mohr to subject the leaves of *Gleditschia triacanthos*, Lin., which have been indicated as the source of the new alkaloid, to proximate examination. All his endeavors, however, to isolate an alkaloid, or even to obtain indications of the presence of such, have been futile, his experiments being fully recorded in Pharm. Rundschau, Nov. 1887, 250.

Experiments recorded by Mr. August Drescher (Ibid, Dec. 1887, 279) also prove the absence of alkaloid in the leaves of *Gleditschia triacanthos*, Lin.

Gleditschia Triacanthos—*Examination for Alkaloid.*—Mr. Abraham J. Metz has taken the trouble to collect some leaves of *Gleditschia triacanthos* on the banks of the Mississippi, about 10½ miles above Donaldsonville, this being as near as could be ascertained the locality where the Gleditschia leaves referred to by Dr. Claiborne and Messrs. Goodman & Seward as containing an anæsthetic alkaloid, had been obtained. The author gives the details of some experiments, the results of which show these leaves to contain alkaloid, but none possessing the particular anæsthetic properties claimed.—Amer. Drugg., Jan. 1888, 1–2.

Entada Scandens—Saponin a Probable Constituent of Its Seeds.—Mr. John Moss having his attention attracted to the reputed poisonous nature of the large seeds of this plant, known as the

Mackay Bean, made a chemical examination of some specimens supplied him by Mr. Holmes. The lomentum received was 13 inches long, and had one or more cells broken from the style end. The cells are well marked, ligneous, red brown in color, and easily separable, being held in position by permanent sutures on each margin; they are from 3 to 3½ inches long and 3 inches wide, including the sutures. From each suture on both sides are obvious transverse striæ, which are lost about three-quarters of an inch from the margin. The sides of the division are also separable from each other, and between them is enclosed a single smooth shining seed, of a dark chestnut-brown color, covered as to the center by cinnamon-brown powder, which has been rubbed from the inner surface of the cell. The latter is marked by evident radical furrows extending half an inch from the margin. The seeds are lenticular and nearly round, 1⅝ to 1⅞ of an inch in diameter, and $\frac{15}{16}$ of an inch thick; the hilum is very small but well marked, and is on one of the longer sides. A seed weighs 330 grains, of which 150 grains are integuments, and 180 grains contents. The chemical examination of the seeds so far has not revealed any poisonous substance. Besides a few crystals of an undetermined substance, the author has had abundant evidence of the presence of "saponin," which is poisonous only in a modified degree.—Yearbook of Pharm., 1887, 454–457.

Enterolobium Timbouva—Saponin a Constituent.—Mr. Licopolis has found saponin a constituent of this Brazilian plant. It is present in all the organs, but more especially in the pericarp of the fruit.—Pharm. Jour. and Trans., August 27, 1887, 171; from Bull. Soc. Bot., 1887, 49.

Abrus Precatorius—Character of Proteids in the Seeds.—Mr. Sidney Martin records some experiments made to determine the characters and kinds of proteids in jequirity seeds. He finds two, the one a vegetable "paraglobulin," the other "*a*-phytalbumose." Investigations to determine the physiological action of these proteids are in progress. For the present, the author calls to notice the close resemblance between the proteids of the papaw juice and those of jequirity.—Pharm. Jour. and Trans., Sept. 17, 1887. 234.

Anagyris Fœtida—Proximate Analysis of the Seeds.—Dr. Reale has subjected the seeds of *Anagyris fœtida*, the leaves of which have long been populary used in Greece and Cyprus as "false senna," to proximate examination. He obtained a non-drying fixed oil, two resinoid bodies, a citron-yellow glucoside, and an alkaloid, for which he proposes the name

Anagyrine. This base is amorphous, very hygroscopic, extremely bitter, has the composition $C_{11}H_{34}NO_8$, and forms hygroscopic salts with the inorganic and organic acids, the platinum compound alone being stable. It is best obtained by precipitation with tannin and decomposition of the tannate with plumbic hydrate.—Pharm. Jour. and Trans., March 3, 1888, 743; from Pharm. Ztg., Feb. 1, 1887, 62.

Arachis hypogæa—Characters of Fatty Acids in the Oil.—See *Groundnut Oil* under "Organic Chemistry."

Agari-bai—A South American Remedy for Catarrhal Affections.—A drug has recently been introduced from South America, which under the name of "Agari-bai" enjoys a reputation in the Argentine Republic as a remedy for catarrhal affections, being used in form of infusion. The drug consists of the leaves and stalks of an undetermined papilionaceous plant. The leaves are dotted with oil glands, have an aromatic bitter taste, and resemble fœnugreek in odor.—Apoth. Ztg., May 9, 1888, 250.

Wars (*Wurrus*)—*Origin, etc.*—Prof. Flückiger, referring to his "Contribution to the History of Wars," in June (see Proceedings 1887, 178), observes that there is another way still of explaining this curious substance (described by Mr. Kirkby—Rep.) He is informed by Prof. Arthur Meyer that he regards it as consisting of nothing else than the natural starch grains of *Flemingia*, supposing the seeds to have been soaked and boiled in water. Prof. Meyer had some of those seeds treated in this way and then mixed with red sand, by which treatment the large starch grains were altered so as to resemble closely the matter described by Prof. Flückiger and by Mr. Kirkby. It remains, therefore, to be proved whether the people of Harrar really submit the seeds or pods of *Flemingia* to such a process, perhaps in order to get a cheap kind of substitute for true wurrus or kamala.—Pharm. Jour. and Trans., Aug. 6, 1887, 110–111.

Waras—Composition and Relation to Kamala.—Mr. David Hooper describes the method of collecting the drug, variously known as

Waras, *Warus*, *Wurrus*, *Wurrhus*, *Wors*, *Wars*, *Vars*, and *Huars*, from *Flemingia Grahamiana*, W. aud A., growing on the northern slopes of the Nilgiri plateau, gives a description of its character, and of its chemical composition as determined by him, and compares it with kamala, as follows:

CHEMICAL COMPOSITION.

	Waras.	Kamala.
Resinous coloring matter	72.83	78.19
Albuminous matters, etc.	8.20	7.34
Cellulose	9.50	7.14
Water	3.44	3.49
Ash (principally sand)	6.03	3.84
Volatile oil	trace.	trace.
	100.00	100.00

POINTS OF DIFFERENCE.

	Waras.	Kamala.
Color	Purplish-red.	Brick-red.
Specific gravity	1.37	1.32
Solution in alcohol (1 in 20)	Deep orange-red.	Orange-red.
Solution in alkali	Deep crimson-brown.	Deep orange-red.
Heating to 100° C.	Blackened.	No change.
During ignition	Moderate intumescence.	Violent intumescence.
Boiling water	Emulsion formed.	Yellow solution.
Heating with soda	Odor of citron.	Odor of bitter almonds.

The spectrum of the tinctures prepared from the two drugs are not distinguishable. The value of waras as a dye-stuff is insignificent, simply imparting a pale yellow to cotton, but a brilliant orange-brown to silk.—Pharm. Journ. and Trans., Sept. 10, 1887, 212–215.

Lupinus Luteus—Relative Value of the Methods of Kellner and of Soltsien for the Removal of the Bitter Principle.—Mr. Geo. Baumert has subjected the methods of Kellner and of Soltsien for the removal of the bitter substance in *Lupinus luteus*—used largely as cattle food in Europe—to critical examination.

Kellner's Method consists in a process of maceration for 24 hours, followed by one hour's steaming in a steam-vat, and then extraction with water for two days.

Soltsien's Method consists in macerating the lupines in water, containing 10 pounds of ammonia water for a hundred of the substance, for 2 to 3 days, at a temperature not exceeding 13° C., and then washing out with water during 7 days. The loss of substance by either method amounts to about 25 per cent., but the removal of the bitter substance—which is poisonous—is more complete by the method of Soltsien, which moreover, while occupying more time, can be conducted in and with the utensils ordinarily found on a farm, whereas the first method requires a steam apparatus. A somewhat larger percentage of albuminoid substance is extracted by the method of Soltsien, but this the author regards of very little consequence in view of the more thorough and practical removal of the bitter poisonous substances by the latter method.—Arch. d. Pharm., May 2, 1888, 425–432.

Lupinus luteus, Lin.—*Constituents.*—Messrs. E. Schulze and E. Steiger have isolated an alkaloid, *arginine* (see under "Organic Bases") from the young plants of *Lupinus luteus*, L., which contain also asparagin, glutamin, leucine, tyrosine, amido-valerianic acid and phenylamidopropionic acid, which are doubttess formed from the albuminoids.

Recently germinated blanched pumpkin plants contain likewise arginine, but in smaller proportion than the above.—Amer. Jour. Pharm., Aug. 1887, 428.

Lupinus Seeds—Chemical Constituents.—Mr. Geo. Baumert reviews the history of the chemical constituents of the seeds, *Lupinus luteus* and *Lupinus angustifolius* as developed during the past thirty years, which may be referred to in Arch. d. Pharm. May 2, 1888, 432–440. The review is accompanied by an extensive bibliography on the subject.

TEREBINTHACEÆ.

Mexican Lign Aloes—Botanical Sources, etc.—Mr. E. M. Holmes reviews an interesting paper by Mr. Poisson on "Mexican lign aloes," which was published in the "Bull. de l'Assoc. pour l'Avancement des Science" (xiii., 305), but in consequence of the difficulty of access of this publication, has been overlooked. An essential oil bearing the above name has been a commercial article for many years, but nothing definite has hitherto been known concerning the botanical source. Mr. Poisson has now determined the wood and oil to be derived from

Bursera Delpechiana, a new species named in honor of Mr. Delpech, who originally sent the specimens of leaves, flowers and fruit of the plant from Mexico. A complete botanical description of the tree is given, for which reference must be had to Mr. Holmes' original paper. Respecting the wood, Mr. Delpech states that in a fresh and healthy state it is almost devoid of odor, and it is only where a branch has been broken off or insects have pierced the wood that the oil becomes developed. He states that old trunks may afford as much as 10 to 12 per cent. of oil. This difference in the wood is not recognized by the native Indians who collect it, and consequently the tree is felled in a reckless manner, so that it has almost disappeared from Cuantla Morelos, where it formerly abounded. The structure of the wood presents the following characters: The fibres are of medium length, with the walls only slightly thickened; each is divided transversely by numerous thin walls constituting a kind of ligneous parenchyma, of which the whole wood is formed. On transverse section the fibres are seen to be all of equal thickness, so that it is not easy to distinguish the zones of growth of the wood. The vessels are of large size, with numerous transverse trabeculæ, which on longitudinal section are seen to give a moniliform appearance to the vessels; they are dotted all over, the dots being surrounded with areolæ. The medullary rays are thin, and have two to four courses of cells in thickness. It is chiefly in the fibres and medullary rays that the nearly solid odorous substance occurs. It is of a yellowish resinoid aspect under the microscope, and fills them either wholly or partially. All the fibres, however, do not contain it, and it is most abundant where the wood is streaked with dark veins. This matter is soluble in alcohol, so that the wood treated with spirit becomes transparent under the microscope. In the green and healthy state the wood presents the same appearance, without any trace of oil, although at the same time the oil may be perceived in the fruits and bark by rubbing them. The

Oil of Lign Aloes has been examined by Messrs. Verneuil and Poisson. Their experiments show that the wood cut into shavings readily yields the oil by distillation with steam, 7 to 9 per cent. being thus obtained, and the wood when dry is then found to be free from odor. When the oil is dried over chloride of calcium, it distils over almost entirely between 189° and 192°, a small quantity of a resinous body of a much less volatile character remaining in the still. It is an oxygenated body having the formula 2 ($C_{10}H_8$) 5 H_2O, this formula answering to that of a hydrate of terebenthene or of an isomer. The oil slowly absorbs oxygen and becomes resinified. It does not combine with bisulphite of sodium. The red-brown coloration which it takes under concentrated sulphuric acid is analogous to that which turpentine produces with the same acid. The odor of the oil is likened by M. Poisson to a mixture of lemon and jasmin. The specimens that were examined by Mr. Holmes have more semblance to bergamot in odor. It is difficult to say whether other species of *Bursera* yield this oil or no. Mr. Poisson suggests that it is probably obtained also from *Bursera Aloexylon*, Engl. (*Elaphrium Aloexylon*, Schiede).—Pharm. Jour. and Trans., Aug. 13, 1887, 132.

Rhus Glabra—Use of the Leaves and Berries.—Mr. Oscar J. Lache states that a

Good Ink may be prepared from sumach leaves. A decoction is prepared by boiling 1 oz. of the bruised leaves for half an hour in one pint of water, and straining; 90 grains of sulphate of iron, and 60 grains of gum arabic, are added. The ink has at first a brownish cast, which disappears in a few days; after about two weeks it can scarcely be distinguished from ink made from nut-galls.

On evaporating an infusion of the berries hard crystals of calcium acid malate are obtained, having a red-brown color; by repeated recrystallization they may be obtained clear and transparent. They are decidedly acid, and are with difficulty dissolved in cold water. The acid was prepared by Procter's process (see U. S. Disp.) On precipitating the solution of the calcium salt with acetate of lead, and decomposing the precipitate with sulphuretted hydrogen, a filtrate is obtained, which on evaporation yields prismatic crystals of *malic acid.* The yield is from 3 to 4 per cent.—Amer. Jour. Pharm., July 1887, 335.

Artar Root—Presence of Two Alkaloids.—Messrs. Giacosa & Monari have isolated two alkaloids in "artar root," a drug obtained from the west coast of Africa, and identified by Dr. Easmore to be evidently derived from

Xanthoxylum Senegalense.—One of these alkaloids is present in considerable quantity, the other in smaller quantity, but neither appears to have been named. The first mentioned is apparently uncrystallizable, soluble in ether, insoluble in water, and forms salts with sulphuric, hydrochloric, and nitric acids. It shows none of the reactions of berberine, but causes muscular irritability with coagulations of myosin, and spasmodic movements like those produced by veratrine. When given internally it causes considerable slowing of the heart's action with increase of energy. The second alkaloid is crystallizable in fine red laminæ, is soluble in water, and forms yellow salts with acids.—Pharm. Jour. and Trans., July 30, 1887, 91; from Pharm. Centralh., No. 25, 1887, 314.

Schinus Molle—Characters and Uses of the Fruit.—Specimen samples of the fruit of *Schinus Molle* have recently been sent to the London market from Colombia on speculation. They are remarkable for their striking resemblance in flavor to a mixture of pepper and fennel. They have however a slight bitterness and acridity. In Peru and Brazil the fruit is used to make a syrup, vinegar, and pleasant drink.—Pharm. Jour. and Trans., Dec. 3, 1887, 461.

Mastich—Comparative Composition of Fresh and Old Samples.—Mr. E. Reichardt communicates the results of investigations made to determine the composition of mastich, perfectly clear fresh samples and old samples of the drug being used for the experiments. The s. g. of the fresh mastich was 1.068; of the old mastich, 1.072. Benzol dissolved from old mastich 66 per cent., and from the recent article 90 per cent.; the elementary analyses of these portions render it likely that they consist mainly of $C_{10}H_{16}O$ mixed with $C_{10}H_{16}O_2$ in variable proportions, depending upon age and exposure. The portion insoluble in benzol contains less carbon, and as obtained from recent mastich, agrees with the formula $C_{10}H_{15}O_3$, and that from old mastich, $C_{10}H_{15}O_4$. On dry distillation old mastich only yielded a distillate of a very slight acid reaction; the tar commenced to boil at 75°, and yielded a colorless fraction, boiling at 108°, a yellow portion boiling at 220°, and a dark green oil, boiling at 350°. All contained oxygen and possessed an odor recalling that of thyme, lavender or rosemary.—Arch. d. Pharm., Feb. 1888, 154–163.

RHAMNACEÆ.

Rhamnus Infectorius—Source of the Ferment that Produces the Yellow Coloring Matter from the Berries.—Prof. H. M. Ward and Mr. J. Dunlap have made some important observations respecting the seat of the ferment that appears to be necessary to develop the yellow coloring matter in the berries of *Rhamnus infectorius*, known in commerce under the name of

Yellow Berries.—It has long been known that a beautiful yellow solution can be obtained by simply macerating the entire fruits in water, but that dyers find it necessary to crush the fruits in order to obtain a satisfactory dye, which the pericarps alone do not yield. Messrs. Liebermann and Hörmann (see Proceedings 1879, 264) determined the yellow coloring matter to be a glucoside,

Xanthorrhamnin, which under the action of some ferment in the fruit splits up into *rhamnin* and glucose. The experiments now made by Messrs. Ward and Dunlap show that the ferment resides in the raphe or adherent funicle of the seed. When the intact fruits are soaked in water the ferment is dissolved and acts on the xanthorrhamnin in the pericarp, but the precipitate of rhamnin which is formed, is withheld chiefly inside the fruits, thus explaining why the dyers should crush the fruits, since it is the insoluble semi-crystalline precipitate that they want. The authors also examined the fruits of *Rhamnus tinctorius*, Wand. R., *R. carolinianus*, Walter, *R. Wicklius*, and *R. catharticus*, L., but found no trace of ferment in either of them.—Pharm. Jour. and Trans., Oct. 29, 1887, 360; from Annals of Botany.

Rhamnus Wightii—Characters and Chemical Examination of the Bark.—Mr. David Hooper draws attention to an Asiatic variety of buckthorn bark, obtained from *Rhamnus Wightii*, a common shrub in the more elevated parts of the western forests of Madras and Bombay. He describes the dried bark as occurring as single quills or in curved pieces from two to three mm. in thickness. The outer surface is dull brown in color, beset with numerous corky protuberances or lenticels opening longitudinally, and sometimes closely covered with whitish or greenish lichens. The younger barks are ashy-grey with fewer lenticels; the older barks present a more rugged surface, due to the growth of the cork and the occurrence of deep transverse cracks, and are much thicker. The outer surface of the middle layer is reddish-brown, and exhibits indentations and transverse markings corresponding with the warts and cracks of the exterior layer. The inner layers consist of pale liber fibres running through a mass of cells containing yellowish-brown coloring matter of waxy consistence. The inner surface is dark chocolate-brown, becoming almost black when kept for some weeks. The fracture is short externally and tough and fibrous internally. The taste is astringent and bitter, but not unpleasant, a sweetish after-taste being left on the palate. The odor of the bark recalls that of tan. The action of solvents was as follows: ethereal extract, 2.82; alcoholic extract, 27.98; watery extract, 7.18; alkaline extract, 8.42; acid extract, 20.80; residue, 32.80; total, 100. The author gives the percentage of the different principles isolated and determined as follows:

Crystalline principle	0.47
Light brown resin soluble in ether	0.85
Red resin soluble in ether	1.15
Red acid resin soluble in alcohol	4.56
Indifferent α-resin soluble in alcohol	3.80
Indifferent β resin soluble in alcohol	1.64
Tannin	2.63
Bitter principle	1.23
Sugar, reducing	2.20
Sugar, non-reducing	10.12
Malic acid (?)	0.89
Cathartic acid	4.42
Extractive soluble in water	0.65
Albuminous matter	6.67
Modification of arabin soluble in alkali	1.75
Oxalate of calcium	7.43
Starch	7.87
Modification of arabin soluble in acid	5.54
Cellulose	16.17
Suberin, etc.	6.38
Lignin, etc	9.80
Ash (balance of)	3.39
Moisture and loss	0.38
	100.00

The crystalline principle appears to be similar to that from cascara sagrada, described by Prescott in 1879. It constitutes, under the microscope, white, transparent crystals, which are sparingly soluble in water, ether, alcohol, and boiling bisulphide of carbon. Respecting the pharmacy of the bark, the author observes that he has prepared a

Liquid Extract of Rhamnus Wightii according to the British Pharmacopœia formula for this preparation from *R. Frangula.* He finds that a considerable portion of the resins remains undissolved when spirit is added to the concentrated extraction, and that more precipitates from the clear extract on standing. He expresses the opinion that the liquid extract should be made by spirituous extraction, since a preparation that does not retain the resins cannot be considered to represent the full activity of the bark.—Pharm. Jour. and Trans., Feb. 18, 1888, 681–683.

Cascara Sagrada—Constituents.—Messrs. H. F. Meier and J. Le Roy Webber have made some interesting studies of the bark Rhamnus purshiana, and communicate their results preliminarily. In addition to the constituents noticed by other experimenters, the authors have determined the presence of a

Lactic Ferment, as well as of glucose and traces of ammonia. The existence of this ferment may be easily demonstrated in a very simple manner. A cold aqueous percolate from four ounces of the bark of Rhamnus purshiana to the pint, is divided into two equal portions, and both exactly neutralized with sodium bicarbonate. One portion is now to be boiled or exposed in a flask to the heat of boiling water for at least a half-hour. That a temperature must be used capable of destroying this ferment, is evident, when the object in view is considered. The addition of a little yeast, to both the infusion and cooled decoction, will illustrate the matter admirably. In the decoction the vinous fermentation alone progresses, while in the infusion a gradual departure from neutrality will be observed, and with increasing acidity a precipitation of the resins, previously held in solution as sodium compounds. The ferment seems to be identical with that existing in numerous vegetable substances, its effects being identical with those of the principle existing in cabbage, licorice root, etc. It seems to be a constituent also of the bark of *Rhamnus Frangula*, and is regarded the constituent that produces the griping or epigastric pain which is sometimes observed, notably when the fresh bark is administered; the inconvenience being doubtless due to the formation of lactic acid. Both the glucose and the ammonia are important constituents from a pharmaceutical point of view, the former rendering the solid extract unstable, whilst the ammonia doubtless has the function of holding the resinous constituents in solution.

Respecting the glucoside described by Prof. Wenzell (see Proceedings 1886, 462), the authors observe that this seems to be peculiar to *Rhamnus purshiana*, as they were unable to determine its presence in the *frangula bark*, as it occurs in commerce. A further examination of the fresh bark—which the authors promise to undertake—will, they think, confirm a remarkable difference between these two barks, inasmuch as experience has demonstrated that Rhamnus purshiana exerts a decided and unmistakable tonic effect, ascribable possibly to this glucoside. The

Glucoside of Rhamnus Purshiana may be obtained in a comparatively pure state for examination by precipitating an aqueous infusion or percolate from cascara with sub-acetate of lead. After removal of the excess of lead by H_2S, the solution exhibits a remarkable decomposition, when boiled with sulphuric, hydrochloric, or lactic acid. The solution becomes intensely bitter, turbid on cooling, and a microscopical examination indicates the presence of a substance, insoluble in water, of an oily or resinous behavior, and also crystals of the bitter substance referred to. This oily, or resinous body, seems to be an excellent solvent for the bitter principle, inasmuch as on cooling, fine crystals may be seen distributed through it. It is evident from the behavior of this solution that the ferment has been separated, and it is, therefore, precipitable by sub-acetate of lead. The authors do not wish to be understood as supposing or claiming that this ferment acts directly in producing a decomposition of the glucoside, because such is not the case. The ferment simply is instrumental in generating vegetable acids, and these latter are the direct agents engaged in the decomposition. A great step in advance will have been made, also, by the recognition of the fact that these changes can take place in the cold, at ordinary temperatures, in the human stomach, in the percolator, and even in the air dried bark itself, the latter to all appearances being in a decidedly quiescent condition. We must not forget that all the conditions are present, even to the extent of the necessary moisture.—Amer. Jour. Phar., Feb. 1888, 87-92.

Cascara Sagrada—Presence of an Alkaloid.—Dr. R. G. Eccles, in the course of some experiments to determine the genuineness of a sample of fluid extract of cascara sagrada, obtained as an unexpected result undoubted indications of an alkaloid in this drug. No examination has been made by the author of cascara sagrada bark. Three samples of fluid extracts, from as many manufacturers, all gave the same indications. It is strange that heretofore no one has suspected the existence of anything of the kind. The quantity is very small, as appears from the fact that an ounce of fluid extract could only be made to give up enough to about 20 minims of one per cent. sulphuric acid to make a positive precipitation with a single drop of Mayer's solution. This is probably why it was not before discovered. If care is not taken in the way of extracting, the results are negative. An ounce of fluid extract is freely and often shaken with an ounce of Prollius' solution during four or five hours. After settling, the ethereal layer is removed with a pipette having a rubber bulb for suction. This is now shaken up with the same volume of one per cent. sulphuric acid every few minutes for a couple of hours more, when the ethereal layer is again removed and the acid one made alkaline with ammonia. This alkaline solution is now continuously shaken with an equal volume of concentrated ether for about ten minutes, after which separation is allowed to occur and the top layer is decanted into a clean beaker. Here it is allowed to evaporate down to about two drams, when twenty or twenty-five minims of one per cent. acid is shaken and stirred with it, while the rest of the ether is being evaporated. On standing now a few hours the resinous matter will separate and leave a clear solution of acid and alkaloid which a drop of Mayer's reagent will at once render turbid and cause the descent of a precipitate. If the attempt is made to evaporate the first or Prollius' solution before acidulating, as is the common method, the alkaloid will be lost. Several attempts made in this way signally failed. The alkaloid must be taken from the full volume of Prollius' solution by shaking with acid, and no attempt at concentration must occur till the final ethereal washing is reached. If enough of it can be isolated to make it worth while to name the new alkaloid, it is probable that the proper appellation would be rhamnine.—Drugg. Circ., March 1888, 54.

Cascara Sagrada—Removal of Bitter Taste.—Mr. F. Grazer observes that a *tasteless* fluid extract of cascara sagrada has recently been introduced. He has experimented and finds that a fluid extract can readily be deprived of its bitterness, without depreciating its activity, by the use of an alkali or alkaline earth in its preparation. He prefers calcined magnesia and gives a process which will be found under "Extracta Fluida."

Cascara Sagrada—Value as Compared to Rhamnus Frangula.—Dr. E. R. Squibb, while admitting the efficiency of the bark of *Rhamnus Purshiana*, known in commerce as Cascara Sagrada, does not believe that it possesses any advantage over the longer and better known bark of *R. Frangula*, admitted into the present Pharmacopœia. He has, however, prepared parallel preparations of the two barks from carefully selected material, and placed it into the hands of many close, careful and disinterested observers, in the hope that by the parallel observations of many, made independently, conclusive testimony as to the merits of the one over the other may be obtained—Ephemeris, Oct. 1887, 984–986.

EUPHORBIACEÆ.

Euphorbia Heterodoxa—Value of the Milky Juice and Resin in Cancer, etc.—Dr. James Bairnsfather has obtained favorable results in the treatment of cancer and malignant ulcers by the milky juice and resin of *Euphorbia heterodoxa*, introduced under the name of

Alveloz. He states that by its application an absorption into the system evidently takes place, causing a profuse secretion of highly colored and offensive urine; the skin improves in color, the patient gains in spirit, and improvement is manifest in the local affection. He describes the appearance of active alveloz to be that of pale butter with the consistence of vaselin, and calls attention to the fact that some samples of "alveloz" supplied him were quite inert.—N. Y. Med. Jour., June 4, 1887, 630.

Ricinus Communis—Analysis of the Leaves, Root, and Stem.—Mr. Addison Lloyd Beck has made a proximate analysis of the leaves, and, partially also, of the root and stem of Ricinus communis, with the following results:

PROXIMATE ANALYSIS BY DRAGENDORFF'S METHOD (MODIFIED).

	Leaves.	Stem.	Root.
Extracted by petroleum spirit	4.582	0.275	0.380
" " ether	2.575	0.316	0.338
" " alcohol	2.490	0.833	
" " water	12.699		
" " diluted NaOH	1.200		
" " " HCl	2.193		
Loss by chlorine	5.440		
Residues, cellulose, etc.	43.590		
Ash	11.220	5.466	7.050
Moisture	12.700	6.100	7.083
Loss	1.311		
	100.		

From the fraction extracted by alcohol, the author obtained some crystals, which were subsequently obtained in larger quantity from a fresh portion of leaves, and proved to respond to the tests for the

Ricinin of Tuson (1864). The crystals were soluble in water, alcohol, and chloroform; gave no reaction when treated with Mayer's reagent and other alkaloidal precipitants, excepting the tri-iodide of potassium. They melt at 194° C.; have a bitter taste, and are colored green with H_2SO_4 and $K_2Cr_2O_7$. In testing for glucosides the results were negative. When heated with caustic soda a decided reaction for ammonia was obtained, thus showing the presence of nitrogen. Professor Wayne had (see Proceedings 1874, 158–159) also obtained ricinin from the leaves; but, while this was identical in other respects with the substance described by Tuson, he regarded it devoid of alkaloidal characters, though admitting the presence of nitrogen. Mr. Beck's results seem to point out the correctness of Mr. Tuson's views, and, with the view of determining its ultimate composition, three combustions were made by him for the estimation of the carbon and hydrogen, and two with soda-lime for nitrogen, estimating oxygen by difference. The results would indicate ricinin to be an alkaloid, having the formula $C_{24}H_{32}N_7O_3$:

RICININ.	FOUND.		CALCULATED.
	FIRST.	SECOND.	$C_{24}H_{32}N_7O_3$.
Carbon	62.00	62.03	61.81
Hydrogen	6.87	7.55	6.87
Nitrogen	21.00	21.00	21.02
Oxygen	10.13	9.42	10.30
	100.	100.	100.

—Amer. Jour. Pharm., Feb. 1888, 93–98.

Acalypha Indica—Curious Inflorescence.—Dr. C. B. Clarke directs attention to the curious inflorescence of *Acalypha indica*, a plant used in India as an expectorant in consumption and bronchitis. The inflorescence consists of a rachis bearing a few scattered female flowers, above which a dense spike of male flowers. This again is succeeded by a prolongation of the rachis, bearing at its apex, in a form resembling that of a T joint of a gas-pipe, a single ovary containing one seed, the two horizontal arms being formed by the two barren cells of the ovary. When young, the terminal flower is placed horizontally on top of the rachis, so that the styles appear on one side and the barren cells of the ovary on the other. During the development of the seed the ovule becomes completely reversed, so that the radicle which should be superior becomes inferior. In the flower spikes which present this singular anomaly, and which are of very common occurrence, the female flowers below the male portion of the inflorescence are frequently sterile.—Pharm. Jour. and Trans., April 28, 1888, 903; from Ann. Botany, 1888, 360.

Hieronyma Alchornoides—Calcareous Deposit in the Cracks and Fissures of the Tree.—Mr. J. H. Hart, Superintendent of the Royal Botanic Gardens at Trinidad, has sent a specimen of *Hieronyma alchornoides* to the Kew Museum, showing the remarkable calcareous deposit in the cracks and fissures and on the surface of the tree, which is recognized as "stone" by the native sawyers. Analyzed by Mr. McCarthy, the deposit gave 85.81 per cent. of calcium carbonate. The deposit is the more remarkable that the soil near which the tree grew is stated by Mr. W. T. Thiselton Dyer to contain only 0.15 per cent. of lime, the chief mineral constituents being silica and oxide of alumina and iron.—Pharm. Jour. and Trans., April 28, 1888, 903; from Ann. Botany, 1888, 361.

URTICACEÆ.

Cannabis Indica—Value of the Tincture in Summer Diarrhœa.—Drs. F. F. Bond and B. E. Edwards recommend the tincture of cannabis indica in the treatment of summer diarrhœa. They state that it possesses the advantage of not interfering with the digestive functions, rather accelerating their return. They give it in doses of ten minims in connection with other remedies.—Pract., July 1887, 9.

Hops—Antiseptic Action Due to Resins.—Dr. Hayduck records some experiments which show that the antiseptic action of hops is not due to the volatile oil nor to the tannin, or bitter principle, but to two soft resins; while the hard resin, which is contained in hops in larger quantity, has little or no antiseptic action. He describes the method of separating these resins, and characterizes them as follows:

(1) A soft resin, precipitated by lead. If an ethereal solution of this resin be treated with solution of copper sulphate, the ether is colored an intense green; the resin therefore appears to form with copper sulphate a green compound soluble in ether. This resin is also soluble in light petroleum spirit.

(2) A soft resin that corresponds with the preceding in being soluble in light petroleum spirit and in giving the copper reaction, but differs from it in not being precipitated by lead.

(3) A hard resin which is not precipitated by lead, does not give the copper reaction, and is insoluble in light petroleum spirit.—Pharm. Jour. and Trans., Dec. 17, 1887, 500; from Pharm. Centralh., Oct. 27, 1887.

CONIFERÆ.

Pinus Sabiniana—Examination of the Oleo-Resin.—Mr. Edward H. Samuels has subjected the oleo-resin of this Californian species of *Pinus* to examination. An abridged description of the tree, from that volume of the "Geological Survey of California" relating to Botany, may find place here, since it is not to be found in ordinary text-books.

Pinus Sabiniana is a round-topped, open-branched tree, with a rough ash-gray bark, slender glaucous branchlets and sparse foliage. The bracts are deciduous and the leaves arranged in threes. The latter are slender, light green, glaucous, 8 to 12 inches long, or sometimes only half that length. The male flowers are oblong, about $\frac{5}{12}$ inches long, arranged in an elongated spike. The involvucral bracts are from ten to fifteen in number, the exterior pair being minute. The cones are lateral, acutish, and massive, from six to ten inches in diameter, and of a deep, mahogany-brown color. This conifer is abundant, but scattered or in small groves over the hot dry hills of the Coast Range, in the Sacramento Valley, and on the foot hills of the Sierra Nevada, throughout the entire State. It differs from all the other pines in its external characters, and is one of the "Nut Pines" used by the Indians as an important means of sustenance. The

Oleo-Resin is collected in the same manner as ordinary turpentine, and greatly resembles that substance in physical properties. It is pale, lemon-yellow, of about the consistence of honey, possessing a mild terebinthinate taste, and a fragrant orange-like odor. Sp. gr. 1.0246. The volatile oil, obtained by distillation in the same manner as commercial oil of turpentine, is colorless, has a peculiar orange-like fragrance, and bears the name of *abietene*. It was examined by Professor Wenzell in 1870, and the author confirms the results then given in detail. The residual resin left in the retort was found by Mr. Samuels to contain a neutral and an acid resinous constituent. The neutral resin has been subjected to ultimate analysis, with results leading to the empirical formula $C_{20}H_{65}O_{11}$. It possesses characteristics which are distinct from *abietin*—the neutral principle of colophony—and the author therefore proposes for it the name of *sabinianin*. The acid resin, for want of time, has not yet be enanalyzed; but he hopes to do so in the near future, when he promises to communicate his results.—Pharm. Rec., Feb. 1, 1888, 39–40.

Terebinthina and Derivatives—Therapeutics.—Dr. Dujardin Beaumetz places the substances derived from turpentine thus, in the order of their value: For maladies of the bladder: oil of turpentine, terpin, terpinol; for maladies of the bronchia: terpinol, terpin, oil of turpentine.—Nouv. Rem., Dec. 8, 1887.

Dammar Resin—Recognition of Adulteration with Pine Resin.—Mr. O. Schweissinger has observed dammar resin, which was adulterated with fragments of very light colophonium. While the two, when separated, are easily distinguished by the character of their solutions in alcohol, that of colophonium being transparent, while that of dammar is turbid, alcohol does not serve for the determination of the adulterant. On the other hand, the method of Kremel (see Proceedings 1887, 258), which depends upon the determination of the acid number of the particular resin, serves an excellent purpose. The acid number of dammar is, according to Kremel, 31; that of light-colored colophoniun is 163.2. On carefully separating the angular clear pieces of colophonium from the rounded turbid pieces of dammar, the acid number of the two were found to be respectively 165 and 30.8. The acid number of an average powdered sample was 62, showing that the adulterated dammar contained about 25 per cent. of colophoniun.—Arch. d. Pharm., Nov. 1, 1887, 966; from Pharm. Centralh., 28, 459.

Catha Edulis—Description and Chemical Examination.—Prof. Flückiger and Mr. J. E. Gerock have communicated a lengthy paper to the British Pharmaceutical Conference, in which they give a detailed historical and histological account, as well as the results of the chemical examination of the drug known in commerce by the name of

Kat.—The drug is derived from *Catha Edulis*, and is used by the Arabs as well as the Abyssinians on account of its stimulating properties, very much like coca is used in South America. The paper is illustrated by cuts, partly taken from Richard's "Botanical Atlas," of a flowering branch, a section of the flower, the leaf, and of microscopical sections of the same. The results of the chemical examination of the drug prove it to contain an alkaloid, which the authors have named

Katine.—It was obtained in too small amount to admit of nearer examination, and was not isolated in a completely pure condition, but a decidedly crystalline acetate was obtained, the aqueous solution of which was not precipitated by tannic or picric acid, nor by chloride of platinum. The authors proved the absence of caffeine in their "katine," which will probably prove liquid and volatile.—Yearbook of Pharm. 1887, 430–441.

Daphnandra repandula—Constituents and Action.—Dr. T. L. Bancroft has found this new species near the Johnstone river, Australia. All parts of this species have a peculiar transient bitter taste; the inner surface of the fresh bark is white, but becomes metallic black on exposure to the air, and again loses its color on drying. The aqueous extract is very poisonous, 10 grains being a fatal dose for warm-blooded animals, and is very rich in alkaloids, all of which, Dr. Bancroft states, are colorless and crystalline. The active alkaloid is soluble in water and to some extent is antagonistic to strychnine. Daphnandra retards the development of bacteria, deodorizes putrid meat, checks the growth of the yeast plant, and kills some water plants.

Daphnandra micrantha, Bentham, has similar properties; it is a shrub growing in the neighborhood of Brisbane.—Amer. Jour. Pharm., Sept. 1887, 448; from Austral. Pharm. Jour., 1887.

Cayota Bark—A New Drug from Mexico.—Mr. C. Councler draws attention to cayota bark, a new drug from Mexico, of undetermined origin. The bark occurs in pieces over 1 cm. thick, of a light to dark reddish-brown color, with a greenish or yellowish periderm. The drug is readily pulverizable, and contains about 27.60 per cent. of tannin.—Pharm. Post, Feb. 19, 1888, 117; from Chem. Ztg., xi. 213.

Coto Bark—Microscopic Structure.—Mrs. Louisa Reed Stowell communicates an illustrated paper in which a description of coto bark and of its microscopic structure is given. The paper cannot be profitably condensed for this report, and reference must therefore be had to the original in Pharm. Era, May 1888, 172–174.

B. ANIMAL DRUGS.

PORIFERÆ.

Turkey Sponge—Collection, etc.—U. S. Consul Bissinger, in "Consular Reports," communicates some interesting points respecting the Turkey sponge fisheries. Sponge fishing extends all along the coast of Batroon, Tripoli, Latakia, and the island of Ruad, north of Tripoli. It is not confined only to native fishermen, for many Greeks come over from neighboring Grecian islands to share the traffic with the Syrians. The catch commences in June and extends to October, this season being the most suitable owing to the calmness of the sea. The diver generally remains at the bottom of the sea from sixty to eighty seconds, the native Syrian diver having simply an open net around his unprotected body, and using no instrument of any kind in collecting the sponges; he cannot be induced, like the Turks, to adopt the diving dress, or "Skafander." The depth to which Syrian divers descend is from 25 to 175 feet; below these depths no good sponges are said to be found. Three kinds of sponges are found here—prime, seconds, and the red sponges taken near Batroon. The latter are by far the best. They have to be cleaned and freed from sand, and then pressed. The best qualities are exported from Beirut to Paris direct, the others go almost exclusively to Trieste, while the Greeks send their share of the catch to different markets in Europe. —Amer. Drugg., April 1888, 69.

Bahama Sponges.—Mr. Frederick Stearns communicates a highly interesting paper on the sponge industry on the Bahama Banks, which is based on his observations during a one month's cruise on a sponge vessel. The author's paper will be profitably consulted in Pharm. Era, May and June 1888, pp. 170–172 and 210–212.

INSECTÆ.

Cantharides—Characters of a Fraudulent Article.—According to "Bull. Soc. Phar. de Bruxelles," cantharides of a worthless nature—the active constituents having been removed by ether—is to be met with in the market. The article looks well and has the characteristic odor, but pressed between the fingers it lacks substance. An ethereal tincture of good cantharides is of a greenish-yellow color. The extract is thick, of a greenish-yellow color, and contains crystals of cantharidin; applied to the skin it produces a blister. Ethereal solutions of the fraudulent article are nearly colorless. The extract is brownish-yellow; there is no trace of crystals in it, and it will not blister.—Amer. Jour. Pharm., Oct. 1887, 490.

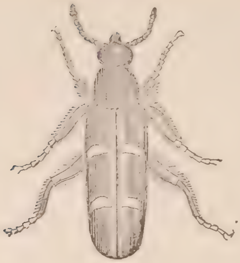
Vesicating Beetles—Two Species from South Africa.—Mr. J. Oldham Braithwaite describes two species of *Mylabris* which have recently reached England from South Africa, where they are used as blistering agents by the natives and by local medical practitioners. The two species are identified by Mr. Cahan as *Mylabris bifasciata* and *M. lunata*, and are described as follows:

Mylabris bifasciata varies in length from 20 to 25 millimetres; the antennæ are about 5 millimetres long, moniliform, consisting of eleven joints, the first two basal joints black, the remainder yellow, gradually increasing in size from base to apex; the head is gibbous, about 3 mm. in length; eyes prominent; thorax pentagonal, 4 mm. long by 3 mm. wide. Elytra, 15 mm. long by 5 broad, crustaceous, convex, black, traversed by two undulating dark ochraceous yellow bands, about 2 mm. in depth; the apical band is bordered by a rufescent margin, and is more rounded at the costal end than the basal band. The tarsi of the first two pairs of legs are five-jointed, those of the last pair have four joints.

Mylabris lunata varies in length from 14 to 18 millimetres. The antennæ consist of eleven articulations, moniliform, gradually increasing in size from base to apex, the first four basal joints black, the remainder ochraceous-brown. Head gibbous, eyes prominent, thorax equal in length and breadth. Elytra, 13 millimetres long by 4 broad; crustaceous, black, traversed by two transverse sinuous bands, and having a very conspicuous reniform or semilunar spot at the base of each wing case, also another lenticular spot on the under costal basilar margin, which is not visable unless the beetle is turned over on its back. The color of all these markings varies in different individuals, from a dull ochraceous-yellow to a bright lemon-chrome. The tarsi of the first two pairs of legs are five jointed, those of the last pair have four joints.

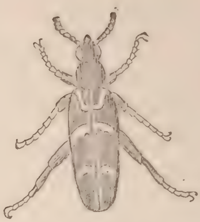
The two insects are shown by the accompanying cuts (Fig. 8 and 9). The first described, *M. bifasciata*, contains the largest percentage of cantharidin, viz., 1.02–1.09 per cent. *M. lunata* contained only 0.296 per

(FIG. 8.)



Mylabris Bifasciata.

(FIG. 9.)



Mylabris Lunata.

cent. The sample of *Cantharis vesicatoria* yielded 0.42 per cent.—Amer. Jour. Pharm., Nov. 1887, 578–580; Pharm. Jour. and Trans., Sept. 17, 1887; Yearbook of Pharm., 1887.

Plant Lice—Preparation for their Destruction.—Mr. Henschke recommends the use of a decoction of quassia wood in which green soap has been dissolved. When the plants are besprinkled with this solution, the lice die at once and can be seen upon the leaves the next day brown and dried up. The plants are not in any way injured.—Rundschau Prag., 1887, 1001; from Pharm. Ztg.

Calandra Granaria—Isolation of Tannin.—Mr. Villon has recently examined the corn weevil (*calandra granaria*), and, in the course of a systematic search after *animal tannins*, found the insect to contain pure tannin to the extent of about three per cent. of its own weight. As early as 1810, Mr. Penut had determined the presence of gallic acid in these insects, which are about three millimeters in length, and of a maroon-brown color.—Amer. Drugg., Dec. 1887, 222; from Bull. de la Soc. des Elèves de M. Frémy., through Chem. News.

California Honey—Production, etc.—Mr. J. E. S. Bell contributes an interesting paper on the production of honey in Southern California. The honey producing district includes San Diego, Los Angeles, Ventura, Santa Barbara, and San Bernardino counties, together with portions of those adjacent. The primary requisites for an apiary are a suitable location, plenty of "bee-feed," and convenient water. The apiaries, or "bee-ranches," as they are commonly called, are mostly located in canyons of the Coast Range Mountains, whose slopes are, in many places, densely covered with several varieties of wild sage and other honey-bearing shrubs and trees. In addition to these sources of honey supply, the so-called grasses commonly known as *wild alfalfa* (Medicago sativa, *Linné*) and *alfilaria* or pin grass (Erodium cicutarium, *L'Heritier*), are much utilized by the bees in gathering in their supplies. Usually from one hundred to three hundred colonies are kept in one place, the number depending chiefly upon the extent of the range. The hives are made in two compartments, the upper one, called a super, being removable. A very lucid description of the methods pursued by bee-keepers is given by the author. As to the honey itself, the author remarks, few persons are aware of the extent to which it is produced, and the excellence of the product. The honey is usually very light-colored, which fact leads many people to believe that it is not pure, but to those who thoroughly understand the circumstances under which it is produced this seems to be an entirely unfounded prejudice. The amount of honey turned out in a single apiary seems to those unaccustomed to such things, enormous. Thirty tons of extracted honey have been produced in a single season in an apiary of three hundred colonies. Indeed, three hundred pounds per colony is not uncommon, a super often being filled once in seven days. This large yield depends to some extent upon the assistance given the bees by the apiarist, but chiefly upon the season. If the preceding winter has been dry, or if there is much fog during the period of honey production, the yield will be greatly lessened, and sometimes is barely sufficient to tide the bees over until the next season. Formerly much loss was occasioned in this way, but now a sufficient portion of honey is always held in reserve to keep the colonies in a strong, healthy condition.—Amer. Jour. Pharm., March 1888, 126–129.

Trebizonde Honey—Source of Poisonous Constituent.—Mr. J. C. Thresh, at the request of Mr. Holmes, examined two samples of honey from Trebizonde, which is reputed to be poisonous, the poison being presumed to be derived from some ericaceous plants, which abound around Trebizonde. The results of Mr. Thresh's experiments, which are given in detail, render it very probable that the source of the poison is an ericaceous plant, but not an *andromeda*, as conjectured by Mr. Holmes, but more likely an *azalea*, which is also the most abundant near Trebizonde. —Pharm. Jour. and Trans., Nov. 12, 1887, 397–399.

Trebizonde Honey—Additional Information.—Mr. H. J. Ross communicates some additional information respecting Trebizonde honey, from which it appears that the *Azalea pontica* abounds in the district from which poisonous honey has been obtained, whereas the non-poisonous honey of Trebizonde is, he believes, derived from the upper districts farther from the sea coast and beyond the region of the azalea and rhododendron.—Pharm. Jour. and Trans., Dec. 21, 1887, 540; from Gardn. Chronicle, Dec. 17, 1887, 748.

PISCES.

Cod Liver Oil—Production in Norway.—Mr. R. B. Anderson, United States Consul General at Copenhagen, in a lengthy report to Government, gives an interesting account of the Norwegian Cod Liver Oil industry, a copious abstract of which is given in Am. Drugg., April 1888, 61.

Cod Liver Oil—Mineral Oil an Adulterant in Russia.—Prof. Poel draws attention to an adulteration of cod liver oil with 50 per cent. of mineral oil, and although it contained this large amount of mineral oil, suspicion was not aroused by the appearance or taste. The stools of patients had the odor of petroleum, and this led to the discovery.—Pharm. Post, 1888, 37.

MAMALIÆ.

Musk—Percentage of Moisture.—The German Pharmacopœia requires that the musk dispensed should be dried to constant weight in an exsiccator over sulphuric acid. No experiments appear to have been recorded as to the loss sustained by musk under this requirement. Dr. G. Vulpius has determined the loss in a sample taken from the bag, and found the loss after the first week to be 4.5 per cent. after three weeks it had lost 5.5 per cent. more, and after nine weeks, 2.5 per cent. more, making a total loss in weight of 12.5 per cent.—Arch. d. Pharm., Sept. 1887, 781; from Apoth. Ztg., 1887, 256.

INORGANIC CHEMISTRY.

GENERAL SUBJECTS.

Crystallization of Metals—Use of Asbestos Vessels.—Mr. F. Stolba had formerly (about 25 years ago) shown that by pouring certain metals in a melted condition into paper or pasteboard boxes, and allowing them to cool partially, handsome crystals of the metal are readily obtained. He now recommends vessels made of asbestos for this purpose as more suitable than those of pasteboard or paper.—Chem. Repert. (Chem. Ztg.), Jan. 15, 1888, 13.

OXYGEN.

Oxygen—Metallic Salts Suitable as Carriers.—Prof. Lothar Meyer has published the results obtained during a systematic investigation as to the extent to which different metallic salts are capable of acting as intermediaries in promoting oxidation. The experiments were made by passing through standardized solutions of the different salts, heated in a water-bath, currents of sulphurous dioxide and oxygen simultaneously, and determining the amount of sulphuric acid formed after a definite time. Salts of manganese were found to be the most energetic oxygen carriers. Next in order came cupric chloride and sulphate, and cuprous chloride, oxide and hydrate, and the metal itself. Other salts that were found to induce oxidation to a greater or less extent were those of iron, cobalt, nickel, zinc, cadmium, and magnesium, but salts of potassium and thallium in dilute solutions were entirely without influence. The action is considered by Prof. Meyer to be one of alternate oxidation and reduction, and as zinc, cadmium, and magnesium are capable of exercising it to some extent, it would seem that these metals may form sub-salts that are as yet unknown.—Pharm. Jour. and Trans., Dec. 31, 1887, 538; from Ber. d. D. Chem. Ges., xx., 3059.

Oxygen—Inhalations.—Dr. B. W. Richardson, from some investigations on the physiological effects of breathing pure oxygen as observed in animals, concludes that in simply passing a few times through the lungs, the gas becomes "devitalized," or incapable of supporting life, although its chemical composition remains the same, and all carbonic dioxide and other impurities are removed. He also states that by passing electric sparks through the gas it became "revitalized," and regained its usual stimulating effect upon the animal economy. The devitalized oxygen would still support life in cold-blooded animals, and combustible bodies would burn in it as brilliantly as ever. Dr. Richardson considers that while the gas is in contact with the tissues or blood of a warm-blooded animal, some quality essential to its life-supporting power is lost.—Drugg. Circ., Nov. 1887, 250.

Oxygen—Inhalations.—Dr. Frank C. Wilson concludes from his experience that oxygen inhalations will be found to be of service in the following classes of cases: First, Those in which, from some obstruction in the air passages, an insufficient supply of oxygen is allowed to enter the lungs, as in croup, constriction of the larynx or trachea, asthma, accumulation of mucus in the trachea or bronchi during coma or severe bronchitis. Second, Where the lung is consolidated, either by pneumonia or tubercular deposit, or in a state of atelectasis, or compressed by pleuritic accumulation, so that only a portion of the lung is pervious to air. Third, Cases of blood poisoning, as by opium, chloroform, uremia, etc. Fourth, Cases of anemia, as auxiliary to appropriate internal medication. Fifth, Cases where it is desired to stimulate the capillary circulation, whether of the skin, as in certain skin diseases, and indolent ulcers, or of the intestines when ulcerated, as in dysentery and typhoid fever.—Drugg. Circ., Nov. 1887, 250; from Southwestern Med. Gaz.

Oxygen—Enemata.—Dr. J. H. Kellogg gives the results of experiments in administering oxygen by enema. He expresses the opinion that the administration of oxygen as an enema possesses many advantages over its use by inhalation, and states some of his grounds for that belief at length. They are substantially as follows: Since not more than one-fourth of the oxygen inhaled is absorbed, while all introduced as an enema is taken into the system, the latter method is much the more economical as well as the more exact. In cases where oxygen is introduced into the system for the purpose of encouraging the oxidation processes by which effete matters are disintegrated and prepared for alimentation, especially those which are acted upon by the liver, the oxygen enema offers a means by which the gas can be almost directly applied where it is most needed, whereas oxygen received by the lungs must pass through the arterial system to the whole body, the liver receiving only a small proportion of the gas. Since digestion is chiefly a process of hydration and oxidation, Dr. Kellogg suggests that probably the introduction of oxygen into the portal circulation by means of enemata may facilitate digestion, and he is now engaged on a series of experiments covering this ground. He also suggests the availability of this form of treatment in the various functional disturbances of the stomach which accompany pulmonary disorders.—Drugg. Circ., Nov. 1887, 250; from Therap. Gazette.

HYDROGEN.

Water—Influence of Impurities on Medicinal Preparations.—Mr. Silvio Plevani calls attention to the necessity of using *pure* water in making medicinal preparations, as well as to the influences that are exerted upon the components by the impurities that are present in the waters so commonly used, these impurities consisting not alone of mineral, but of organic as well as organized constituents. Physicians can rely with certainty only upon the action of the medicaments prescribed when these are not subjected to the influence of such agents, among which that of pathogenic microbes is particularly to be understood.—Arch. d. Pharm., May 1888, 466; from L'Orosi, March 1888, 73.

Water—Removal of Mud.—Thorn purifies water as follows: Filtering paper is soaked in a mixture of 43 parts of liquor ferri chloridi and 57 parts of water, and dried, and a soda paper is made similarly with a concentrated solution of sodium bicarbonate. Shake a strip of the iron paper with the muddy water and then shake with a strip of soda paper. The carbonate of iron formed absorbs all impurities. Strain the water through a sponge.—Drugg. Circ., Dec. 1887, 273; from Pharm. Centralh., 1887.

Potable Water—Multiplication of Micro-Organisms.—Mr. Miguel points out that it will be advisable in examining water for bacteria to do so as soon as drawn, because there is a remarkable increase in the number within a few hours, especially in summer time. He found, for instance, a certain water at 60° F., to contain 48 bacteria in a cubic centimeter, while three hours later at 69° F., it contained 125, 24 hours later at 70° F., 38,000 and after 72 hours 590,000, notwithstanding which the water was perfectly clear and appeared as good as the purest potable water. Incidentally he found that water which at the first examination showed a very great number of bacteria, on standing showed less, probably because its nutritious matter was used up. The only proper way to keep water in the same state as when first drawn is to keep it at the freezing point.—Drugg. Circ., April 1888, 81; from Rundschau (Prag).

Potable Water—Destruction of Disease Germs by Electricity.—Professor Hugo Blanck and R. W. Smith have made experiments which seem to show that it is possible to destroy disease germs in drinking water by passing a powerful electrical current through it.—Pharm. Era, April 1888, 139.

Peroxide of Hydrogen—New Process of Preparation.—Mr. Siegfried Lustig makes peroxide of hydrogen by the following new process: Zinc amalgam is shaken with alcoholic solution of sulphuric acid and air. The mercury and the sulphate of zinc which is formed, are removed by filtration, and the liquid concentrated in vacuo, represents an alcoholic solution of peroxide of hydrogen.—Amer. Drugg., Dec. 1887, 223.

Peroxide of Hydrogen—Rapid Method of Assay.—Mr. Contamine recommends the following method for rapidly assaying peroxide of hydrogen: Measure off several cubic centimetres of the peroxide, render it neutral by the addition of ammonia, introduce it into a measuring cylinder, divided into $\frac{1}{10}$ c.c. and closed at one end, read off the volume, and then introduce a few crystals of permanganate of potassium wrapped in tissue paper. Close the orifice of the tube and shake briskly. The reaction will take place at once, every molecule of the peroxide corresponds to 1 molecule of oxygen. When the liquid has assumed the red tint of the permanganate, the reaction is terminated. The measuring tube is then opened under water, and the level again read off. The difference between the first and second reading gives the quantity of oxygen contained in the peroxide in cubic centimetres. Every c.c. of the usual commercial peroxide of hydrogen, when decomposed by permanganate, yields on an average 10 to 12 c.c. of oxygen.—Amer. Drugg., April 1888, 70; from Dingl. Polyt. Jour.

Hydrogen Peroxide—Use as a Therapeutic Agent.—Dr. I. N. Love gives in a paper read before the St. Louis Medical Society the results of the application of solution of hydrogen peroxide in various forms of mucous irritation accompanied by purulent discharges, in which marked good effects were noted. In scarlet fever and diphtheria particularly, the application of the ordinary ten volume solution diluted with about two parts of water to the nasal cavities and the inflamed mucous surfaces caused the speedy and complete removal of the purulent matter. He was thus enabled to clear out all nasal passages, the fauces, and eventually to apply the strong solution to the false membrane direct, which, after repeated applications, was completely broken down. The relief experienced was marked in each case, and in conjunction with proper constitutional and local measures he believes the peroxide to be of great value. He has also had favorable results from its use in ozæna, chronic nasal catarrh acute coryza, whooping-cough, reflex asthma, follicular tonsillitis, and carcinoma.—Drugg. Circ., June 1888, 128.

NITROGEN.

Nitrogen—Sources in Plants.—Professor Marshall Ward, in a paper summarizing recent researches bearing on the sources of nitrogen in plants, remarks that in the case of the Leguminosæ, which appear to take from the soil more nitrogen than can be accounted for if the only sources are the combined nitrogen found in the soil and the combined nitrogen of the atmosphere washed down in the soil, it must be surmised that the free nitrogen of the air is fixed under such conditions that it can be combined with other elements, and so supplies the deficiency. It has been suggested that possibly the fungi which have been found in the roots of leguminous plants, and which give rise to a hypertrophied condition of the roots, probably co-operate in the fixation of the free nitrogen under such conditions that it enters into combination. Professor Ward considers that the evidence at present available is distinctly against the view that root fungi aid directly in absorbing food materials, but that it is in favor of the supposition that the fungus stimulates the plant to greater metabolic activity. He regards the idea that the combined fungus and hypertrophied cells forming the root tubercles in leguminous plants, etc., may act as a compound organism possessing the power of utilizing free nitrogen, as worthy of further consideration.—Pharm. Jour. and Trans., April 28, 1888, 903–904.

Nitrogen—Simple Process of Estimation.—Mr. Houzeau estimates the total nitrogen (including that present as nitrites) in fertilizers and the like by the following modification of the process of Varentrapp and Will: The ordinary form of combustion tube, closed at one end, is employed, and may be either of glass or iron. Instead of simple soda lime, however, a mixture of soda lime with acetate and hyposulphite of sodium is used; a mixture of equal parts of these two salts being heated to completely expel water of crystallization, powdered, and kept for use in securely stoppered bottles, though not longer than several days. The tube is charged with: (1) a mixture of two grams each of soda lime and of the thio acetate mixture; (2) soda lime occupying 1½ inch of the tube; (3) a mixture of the substances to be analyzed (containing 0.050 to 0.070 gm. of nitrogen) with 10 grams each of soda lime and the thio-acetate mixture; (4) pure soda lime with a plug of asbestos or glass wool. The combustion is made precisely as in ordinary soda lime combustions, the mixture in the end of the tube furnishing a sufficient quantity of carbonic acid, etc., to carry over the whole of the ammonia, which is collected and titrated in the usual manner. If the presence of ammonia is suspected in the thio-acetate, sufficient lime must be added to the mixture during the drying to completely eliminate it.—Pharm. Era, April 1888, 132; from Pharm. Centralh.

Nitrogen Oxide—Density at Low Temperatures.—Messrs. G. Deacomo and V. Meyer have determined the density of oxide of nitrogen (NO_2) at low temperatures, and found that at -70° C., it has the same density as at the ordinary temperature of the room. The density of nitrogen oxide is therefore not changed by a reduction of temperature.—Arch. d. Pharm., Oct. 2, 1887, 928; from Liebig's Ann. Chem., 240, 326.

Liquid Nitrous Oxide—Caution Regarding its Use.—Mr. E. G. B. Barlow calls attention to a possible danger from the proposed use of small light steel bottles or cylinders as containers of compressed nitrous oxide. Liquid nitrous oxide has a very high coefficient of expansion, one volume at 0° C. (32° F.) becoming 1.12 volumes at 20° C. (68° F.); as far as he knows, the rate of expansion above this temperature has not been determined; but assuming it to be at the same rate, one volume at 0° C., would become 1.60 volumes at 100° C., the boiling point of water. Fifteen ounces of liquid nitrous oxide (which is the amount sold as fifty gallons) occupies a space of 27.7 cubic inches at 0° C. At 20° C. it would occupy a space of 31.02 cubic inches, and at 100° C. (212° F.) a space of 44.32 cubic inches. Assuming liquid nitrous oxide to be practically incompressible, like water, iron or steel bottles tested to 4,000 pounds to the square inch, would not be strong enough to stand the pressure of the expanding liquid. He should therefore recommend those who use small light bottles (unless a fallacy in his argument can be pointed out) to ascertain the capacity of the bottles they use; and if the capacity of a fifty gallon bottle is much less than 40 cubic inches, they should be very careful not to place the bottle near a fire, or in any way raise the temperature when full.—Drugg. Circ., Jan. 1888, 9; from Brit. Med. Jour.

Nitrous Acid—Delicate Test.—In the course of a paper on the estimation of nitrous acid, Prof. Frankland states that he relies upon Zambelli's test for the qualitative estimation of minute quantities of nitrous acid, which is as follows: Add to the solution suspected to contain a nitrite, first 1 drop of saturated aqueous solution of sulphanilic acid, then a drop of aqueous solution of phenol, and render the mixture alkaline with ammonia. If any nitrous acid is present, the liquid will assume a color varying from faint yellow to intensely reddish-yellow. The test is capable of indicating the presence of 1 part in 40,000,000 parts of water. In addition to this extreme delicacy, the test has the further advantage that the reagents employed are permanent in solution.—Amer. Drugg., June 1888, 114; from Jour. Chem. Soc., 1888, 364.

Nitrites—Suitable Forms for Medicinal Exhibition.—Dr. G. Armstrong Atkinson, referring to the unsuitability of nitrous acid for medicinal use on account of its instability in contact with water, observes that it is impossible to exhibit moderately pure nitrous acid in solutions stronger than 1 in 3000, a little glycerin being added to retard decomposition. But, inasmuch as the free acid presents no advantage over its salts, he advises aqueous solutions of either potassium or sodium nitrites, the latter being by him considered most suitable for therapeutic use. Such solutions are perfectly stable if kept from fungoid growths.

Nitrite of Ethyl was found by the author uniformly to contain some nitric acid. *Nitrite of Amyl* was usually found to contain from 75 to 80 per cent. of actual nitrite, together with at least traces of nitrate, some samples containing considerable quantities. Regarding

Nitro-glycerin, the author observes that prepared by himself, it was a colorless, sweet body with a slight pungent taste, volatilized very slightly at ordinary temperatures, soluble, but very slowly so, in 760 parts of water and decomposed with formation of nitrite of the base by alkalies and their carbonates. Upon this action of alkalies the author bases methods for the estimation of nitro-glycerin.—Yearbook of Pharm., 1887, 531–537.

Nitric and Nitrous Acids—Comparative Delicacy of Tests.—Mr. P. Walden gives the comparative delicacy of tests for nitric and nitrous acids as follows: Brucine and diphenylamine faint colorations in solutions of 1:500.000 potassium nitrate, and 1:100.000 potassium nitrite. Diamidobenzoic acid, meta-phenyldiamine, naphthylamine, and amido-benzene ortho-sulphuric acid, exhibit a delicacy of 1:5.000.000 with nitrites.—West. Drugg., June 1888, 205; from Jour. Russ. Chem. Soc., No. 1.

Nitrites and Nitrates.—Proposed test for their presence in "Potassium Hydroxide," which see.

Nitrates—Delicate Test for their Presence in Water.—Mr. Bréal proposes the following test which he says will show the presence of 1 part of a nitrate in 2,500,000 of water: One end of a strip of white filter paper is immersed in the solution to be tested, so that the fluid will be drawn up by capillary attraction and evaporate freely from the portion not immersed. After the lapse of a number of hours, a thin slip cut from the end of the strip of paper will be found to contain all the nitrates that were present in the water drawn up by the paper. To demonstrate the nitrates, dry the slip (1 mm. in width) on a white surface, and moisten it with a drop of phenol-sulphuric acid, made by adding one part of crystallized phenol (carbolic acid) to one part of recently boiled pure sulphuric acid, and diluting with two parts of distilled water. A more or less intense red coloration, changed by ammonia to a deep blue or green, indicates the presence of a nitrate.—Drugg. Circ., April 1888, 80.

Nitrates—Determination in Chlorate of Potash, which see under "Chlorine."

Chloride of Nitrogen—Explosive Characters.—Dr. Gattermann has determined that chloride of nitrogen is not alone exploded by direct sunlight, but also by the light of burning magnesium. He also finds that the yellow liquid heretofore known as chloride of nitrogen consists of at least two distinct compounds. Professor Meyer gives directions for a simple and safe way of exhibiting experimentally the explosive nature of this compound, which see in Pharm. Era, April 1888; from Nature, Feb. 1888.

Perchloride of Nitrogen—Formula.—Although the formula NCl_3 has generally been accepted for perchloride of nitrogen, no determination had hitherto been made. Mr. L. Gattermann has now prepared the pure compound by a method which he describes, and he subjected it to analysis, confirming the hitherto theoretical formula to be correct. He cautions against the influence of direct sunlight during the manipulations with this dangerous substance, though the substance will stand considerable friction.—Arch. d. Pharm., May 2, 1888, 457; from Ber. d. D. Chem. Ges., 1888, 751.

Nitro-Sulphonic Acid (Lead Chamber Crystals)—Uses.—Mr. Hugo Bornträger draws attention to the usefulness of nitro-sulphonic acid, sometimes called nitro-sulphuric acid, which constitutes the substance otherwise known as "the crystals of the leaden chambers." The compound may be prepared directly by passing dry sulphurous acid gas into cold, fuming nitric acid, until the liquid becomes syrupy. The author finds it a very useful substance on account of its loosely combined nitrogen oxide. A mixture of equal volumes of this compound and concentrated hydrochloric acid dissolves, *when freshly mixed*, the well known and annoying brown deposits caused by adhering manganic oxide in flasks or burettes, which have contained solution of permanganate, or in which the latter has been decomposed. The same mixture, also freshly prepared, most rapidly dissolves gold without requiring heat. Nitro-sulphonic acid is the most effective agent to liberate iodine from its combinations.—Repert. d. Anal. Chem., 1887, 741.

SULPHUR.

Sulphur—Examinations.—Mr. O. Rössler communicates the results of an interesting series of experiments with a view to determining the source of the efficacy of sulphur in destroying plant life. In the course of these experiments he examined the different forms of sulphur employed, and sums up his results as follows:

Roll Sulphur.—This is nearly free of acid. The small quantities of hydrochloric and sulphuric acids found in it can hardly be regarded as of sufficient value to justify its employment for the destruction of the grape fungus (*Erysiphe Tuckeri*). It contains neither sulphuretted hydrogen and supersulphuretted hydrogen, nor sulphurous and hyposulphurous acids.

Flowers of Sulphur.—These contain considerable quantities of sulphurous acid (100 g. about 3.142 c.cm.), which may be partially oxidized to sulphuric acid. The sulphurous acid is condensed by capillary attraction upon the individual particles of sulphur, and resists its removal by washing to an extraordinary degree. This form of sulphur appears to be the most suitable for the destruction of fungi upon plants, the action of the sulphurous acid being prolonged on account of the difficulty of its removal by the rain and dew. The presence of sulphurous acid, also, makes this form of sulphur the most effective for medicinal use.

Milk of Sulphur.—This contains a relatively large quantity of hyposulphurous acid (100 g. about 0.15 g.), derived from the sulphur compounds from which it is prepared, which always contain hyposulphites. The acid is retained by the sulphur for a long time, possibly also by capillary attraction. In its action upon plant life it is not nearly as efficient as flowers of sulphur. Neither sulphuretted hydrogen nor supersulphuretted hydrogen was found.

Hyposulphurous Acid.—This appears to be more soluble in alcohol than in water. Its dilute solutions are not decomposed below 55°–60° C. The aqueous solution keeps better when admixed with flowers of sulphur than in its pure condition.—Arch. d. Phar., Oct. 1, 1887, 845–858.

Sulphur—Determination.—Mr. O. Rössler recommends the following method for the determination of sulphur as superior to those generally employed. The liquid, which contains the separated sulphur, is boiled with hydrochloric acid until the sulphur sticks together. The clear liquid is decanted as far as possible and the residual sulphur is heated with concentrated sulphuric acid. In the presence of sulphur, this melts at 111°, and floats upon the surface of the acid as oily drops, which may be easily removed on the cooling of the acid. It is necessary to the success of the experiment that the sulphuric acid employed shall have a higher boiling point than the melting point of sulphur. The weakest acid that is suitable for this purpose is one containing 40 per cent. of anhydrous sulphuric acid, the b. p. of which is 127° C.—Arch. d. Phar., Oct. 1, 1887, 881; from Pharm. Centralh., 1887, 403.

Sulphur—Method of Fumigation.—The following directions for sulphur fumigations are given by the Hâvre Congress of Hygiene: Brimstone, in small pieces, is placed in broad and shallow earthenware or cast iron vessels of about 1 liter capacity. As a precaution against fire, these vessels should be placed in tubs holding two or three inches of water. To light the brimstone, a little alcohol is sprinkled on it, or it is tipped with a little cotton wadding dipped into the same liquid. For each cubic meter of room, 30 grams of sulphur are requisite, or about 1 ounce for each 40 cubic feet, all the openings being tightly closed for twenty-four hours. —Amer. Drugg., Nov. 1887, 216.

Sulphur.—Distribution in *Cruciferous Seeds,* which see under "Materia Medica."

Sulphurous Acid and Alkaline Sulphites—Oxidation of their Solutions.—In order to determine the relative permanence of solution of sulphurous acid and of the different alkaline sulphites, Mr. F. O. Dunnington instituted a series of experiments in the University of Virginia, the results of which lead him to the following conclusions:

(1) There is very little difference in the rate of oxidation of the sulphites of sodium, potassium and ammonium.

(2) There is a marked advantage in employing an acid sulphite where it may be substituted for a solution of a sulphite or of sulphurous acid, and is to be kept as a reagent, or dispensed as a medicine.—Proc. Virg. Pharm. Assoc., 1888, 54-56.

Sulphites—Determination in Presence of Hyposulphites and Sulphates.—In treating neutral solutions of alkali sulphites with chloride of barium we obtain a double decomposition: $K_2SO_3+BaCl_2=BaSO_3+2KCl$, and the liquor, strongly alkaline at first, becomes exactly neutral. If we treat a solution of alkali bi-sulphite in the same way a neutral sulphite of barium is also formed, and half of the sulphurous acid is set free: $2KHSO_3+BaCl_2=2KCl+Ba\,SO_3+H_2SO^3$. Therefore a mixture of alkali sulphite and bisulphite which has a clearly alkaline reaction, will contain free sulphurous acid after the addition of chloride of barium. This suggests a quick method of testing. It suffices to neutralize the mixture of sulphites and hyposulphites by hydrochloric acid, being careful to avoid excess, and to precipitate with chloride of barium. The sulphurous acid will pass over on distilling, and the filtrate may be titrated with iodine.—Bull. Com., June 1887; Am. Jour. Pharm., Aug. 1887, 400.

Sulphites—Determination by means of *Iodine*, which see.

Sulphurous Acid—Value in Whooping Cough.—Dr. Mohn discovered after disinfecting the bedding of one of his own children who had suffered from scarlet fever, that another child who had whooping cough and who accidentally inhaled some of the fumes of the sulphur, was suddenly cured of the disease. Acting on this suggestion, he has treated other cases of pertussis by placing the patients in a room where sulphur had been burned in the usual manner in which it is employed for disinfectant purposes. He claims that after being put to bed in such a room, the patients awake the next morning cured.—Amer. Jour. Pharm., Sept. 1887, 444; from N. E. Med. Monthly.

Sulphuric Acid-Theory of the Lead Chamber Process.—Mr. G. Lunge communicates the results of his exhaustive studies respecting the formation of sulphuric acid in the lead chamber process. He concludes that this process does not consist in the alternate reduction and oxidation of nitrogen oxides, but regards it as consisting in the condensation of nitrous acid with sulphurous acid and oxygen to form *nitroxyl-sulphuric* acid, which by the action of water splits into the original nitrous acid again and sulphuric acid.—Arch. d. Pharm., April 2, 1888, 365–366; from Ber. d. D. Chem. Ges., 1888, 67.

Sulphuric Acid—Estimation in Water.—Mr. Fricke gives the following simple and accurate method for estimating sulphuric acid in water: Boil 200 c.c. of the water with a few drops of solution of carbonate of sodium to precipitate lime, and restore the volume when cold. Neutralize 100 c.c. of the filtrate, and boil with a measured quantity of baryta water of known strength. Precipitate excess of baryta by carbonic acid, boil, collect the precipitate, dissolve in decinormal hydrochloric acid. Titrate back with decinormal alkali, and from the quantity of acid consumed, calculate the amount of baryta that has combined with sulphuric acid.—Pharm. Era, Dec. 1887, 446; from Chem. Centralbl., 1887.

Pure Hydrosulphuric Acid—Preparation from Sulphide of Barium.—Mr. Clemens Winkler has for the last twenty years prepared gaseous hydrosulphuric acid, which is absolutely free from arsenic, by the use of a specially prépared sulphide of barium (which see under "*Barium*"). The sulphide, in pieces of suitable size, is introduced into the generator, and evolves, on the addition of dilute hydrochloric acid, a steady and abundant flow of pure hydrosulphuric acid gas.—Amer. Drug., Feb. 1888, 32–33; from Zeitsch. f. Anal. Chem., 1888, 26.

Sulphuretted Hydrogen—Removal of Arsenic.—Mr. Oskar Jacobsen proposes a method for the removal of arsenic from sulphuretted hydrogen, which is dependent on the well-known fact that arsenuretted hydrogen and iodine combine even at the ordinary temperature to form arsenous iodide and iodhydric acid, while sulphuretted hydrogen has no action upon solid iodine or its strong solutions in iodhydric acid. The sulphuretted hydrogen is therefore to be passed in a moderate condition of dryness over solid iodine. The author obtained very satisfactory results.—Arch. d. Pharm., Sept. 2, 1887, 823; from Ber. d. D. Chem. Ges., 1887, 1999.

Sulphuretted Hydrogen—New Method of Administration.—Dr. Battesi recommends to give one or two teaspoonfuls of a solution of monosulphide of sodium, containing one part in five hundred, either while fasting or four hours after meals, and then immediately follow it by a teaspoonful of fresh neutral mixture or a tumbler of soda water. In the stomach the carbonic acid liberates sulphuretted hydrogen from the sulphide. The two gases are absorbed by the stomach and exhaled by the lungs.—Drug. Circ., March 1888, 58; from Arch. d. Pharm.

CHLORINE.

Hydrochloric Acid—Probable Cheap Source.—Messrs. Gehe & Co. observe that wherever the new ammonia process for the manufacture of sal soda has been introduced, the commercial value of hydrochloric acid—

which is not obtained as a by-product in this process—has materially advanced. Efforts have been made during a number of years to utilize the immense quantities of solution of chloride of magnesium which are obtained at the Stassfurt mines as a waste product. A special aim has been to substitute magnesia for the lime in the regeneration of the ammonia from the chloride of ammonium produced during the conversion of the chloride into the carbonate of sodium. If this succeeds, as there is reason to expect, and the chloride of magnesium can also be used to generate both chlorine and hydrochloric acid, this branch of chemical industry will be completely revolutionized.—Amer. Drugg., June, 1888, 106; from Gehe & Co's. Handelsbericht, April, 1888.

Hydrochloric Acid—Preparation of a Delicate Test Paper.—See Turmeric Test Paper, under "Pharmacy."

Hydrochloric Acid—Determination in the Gastric Juice by Vanillic Phloroglucin, which see under "Organic Chemistry."

Chlorates—New Process by the Intervention of Magnesia.—Mr. Longuet Higgins describes a new process for the preparation of chlorates, in which the lime usually employed is advantageously replaced by magnesia, while there are some important differences in the details of the process. In the first place the magnesia used is prepared by roasting magnesite; after roasting, the mineral consists of about 92 per cent. of magnesia, with some lime and traces of iron and manganese, the whole being partly combined with carbonic acid and silica in varying quantities. The roasted mineral does not slake like lime, and has, therefore, to be powdered and suspended in water. Chlorine gas is then allowed to act upon it. It does so without raising the temperature to the high degree observable in the case of lime, and it has also been observed that the intermediary stage, viz., the formation of hypochlorite, is much more transitory, if at all existent. Then the pink manganese-colored liquors are not an indication of full chlorination, as in the case of lime. The most important point of difference is in the comparative yield of chlorate; with lime we have stated that 1 to 5½ is a fair average; with magnesia it is generally 1 to 5.1, that is, 7 per cent. less chloride in the case of magnesia, and what chloride is produced is marketable, obviously a very considerable saving. Moreover, potassium chlorate is less soluble in solution of magnesium chloride than in calcium chloride solution. After the magnesia liquor is saturated with chlorine it is allowed to settle, then evaporated, whereby 50 per cent. of the magnesium chloride ($MgCl_2.6H_2O$) crystallizes out. The mother liquor contains chlorate and chloride in the proportion of 1 to 2.8. At this stage the liquor is carefully tested, and only as much potassium chloride added as will react with the magnesium chlorate. If an excess of chloride is added it combines with some of the magnesium chloride, forming a double salt (carnellite,

$KCl,MgCl_2,6H_2O$), which crystallizes along with the potassium chlorate, and is difficult to wash out. If too little potassium chloride is added, some magnesium chlorate remains, and is not recoverable as such. With the addition of potassium chloride the process is practically at an end so far as the chlorate is concerned, recrystallization serving to purify the salt. But the recovery of the magnesium chloride remains, and the process becomes even more interesting. The mother liquor contains magnesium chloride, calcium chloride, potassium chlorate, gypsum, and a little iron. It is first neutralized, then run into a still, where the chlorate is decomposed with hydrochloric acid, the chlorine given off being utilized. After this any iron present is precipitated with magnesia, then a sufficient quantity of kieserite ($MgSO_4,H_2O$) is added to precipitate the calcium salts. After this settles the liquor is fit for evaporation.—Drugg. Circ., Sept. 1887, 197; from Chem. and Drugg., 1887.

Chlorate of Potassium—Commercial Quality.—Mr. G. E. Norton examined these commercial samples of chlorate of potassium. Instead of leaving 60.8 per cent. of residue on igintion, the residue amounted respectively to 55, 56 and 57.5 per cent. In all other respects the salt corresponded to the officinal requirements.—Pharm. Era, Sept. 1887, 322.

Chlorate of Potassium—Detection of Nitrate.—Mr. Jorissen recommends the following method for the detection of nitrate in chlorate of potassium: A few grams of the suspected chlorate are shaken with about 10 c cm. of water, the liquid is decanted after a short time, 3 drops of concentrated acetic acid are added to the liquid, together with a piece of zinc, which is then allowed to stand 5 to 10 minutes. The zinc is removed, a few drops of Griess' reagent (meta-diamido-benzol chlorhydrate) are added, and the mixture is shaken. In the presence of nitrate, a yellow color is developed, which darkens gradually until in the presence of 1 per cent. of nitrate in the chlorate, it becomes dark brown-yellow.—Arch. d. Pharm., 1887, 882; from Jour. de Pharm. d'Anvers, July 1887, 320.

BROMINE.

Hydrobromic Acid—Preparation from Bromide of Barium.—Mr. Hugo Andress states that, in his judgment, the most economical method of preparing hydrobromic acid is to decompose bromide of barium with sulphuric acid. The bromide is dissolved in 2 parts of water, and the barium is precipitated by the calculated quantity of sulphuric acid, diluted in the proportion of 1 part of acid to 3 of water. The strength of the product is ascertained by its s. g., and it may then be suitably diluted. A 10 per cent. acid (at 15°C.) has the s. g. 1.077; a 25 per cent. acid one of 1.209. The

Bromide of Barium for this purpose is easily prepared by triturating together 100 parts of carbonate of barium and 95 parts of bromide of ammonium with a few drops of water, until a fine, uniform powder is produced. This is gently heated for some time until no more carbonate of ammonium can be detected by a glass rod dipped in hydrochloric acid. The residue is dissolved in water, the solution filtered and evaporated.—Amer. Drugg., April 1888, 65; from "Rundschau."

IODINE.

Iodine—Standardizing Volumetric Solutions.—Mr. W. Kalmann proposes a method for standardizing iodine solutions intended for volumetric use, which is based upon the fact that when iodine is brought in contact with a sulphite, the whole of the iodine is converted into hydriodic acid, which is then titrated with soda solution. The operation is carried out as follows: A measured quantity of the iodine solution is put into a beaker and then gradually mixed with just enough solution of sulphite of sodium (which may contain sulphate, but must not contain either hyposulphite or carbonate) to cause the liquid to lose its color. A few drops of solution of methyl-orange are now added, and afterwards a one-tenth normal solution of soda is allowed to flow in from a burette, until the rose-red tint of the liquid passes into yellow. The method can inversely also be applied to the determination of a sulphite, or a mixture of a sulphite and hyposulphite, provided no uncombined bases or carbonates are present.—Amer. Drugg., April 1888, 71; from Zeitschr. f. Anal. Chem., 1887, 727.

Iodine—Reaction with Iron.—Mr. Fleury has made some observations which seem to show that the reaction between iodine and iron is not characterized by the simplicity with which it is usually credited, but that under certain conditions iodine acts as an oxidizing agent. As is known, when these two bodies are brought into chemical contact by the intervention of water, there is at first an energetic reaction, with development of heat. If, however, the containing vessel is cooled so that the temperature does not exceed 15° C., the reaction quickly ceases, although the iodine may be entirely dissolved and the liquid strongly colored by it; if the liquid be then filtered, only a residue of iron, free from peroxide, is left on the filter. But if the liquid be heated to boiling, its red color quickly disappears, and upon filtration it yields a notable quantity of ferric oxide, as much as 2 per cent. having been found in one experiment. In order to dissolve all the iron, it is necessary that the iodine should be considerably in excess, and reciprocally the whole of the iodine does not pass into the state of protiodide, except under the influence of iron in excess.—Pharm. Jour. and Trans., Dec. 31, 1887, 538; from Jour. de Pharm. et de Chim., Dec. 15, 1887, 529.

Iodine—Compounds with Ammonia.—It has already been noticed by Bineau that iodine is capable of absorbing considerable quantities of dry ammonia gas, a dark-blue liquid, for which he gave the composition, $3NH_3\ 2I$, being formed. Mr. F. Rasching, by passing ammonia into a flask containing iodine and cooled to 20°, obtained a compound having the composition given by Brineau; but if the flask is heated to 80°, a compound corresponding very nearly to the formula NH_3I is formed, while when the flask is cooled to —10°, a compound having the composition $I_2\ (NH_3)_5$ is formed. The steel-blue liquid is decomposed by water into iodide of ammonium and iodide of nitrogen. It is soluble in ether, and miscible in all proportions with alcohol.—Arch. d. Pharm., Nov. 2, 1887, 1016; from Liebig's Ann. Chem., 241, 253.

Ammonium Iodide—Preparation.—Various considerations, which Mr. R. Rother gives in detail and at length, have prompted him to suggest the following formula for the preparation of iodide of ammonium:

Iron wire, very fine and in long spiral loops	1	troy ounce.
Iodine	3	“ ounces.
Calcium carbonate precipitated	1¼	“ “
Ammonium bicarbonate cryst	1⅞	“ “
Ammonia water,		
Sulphurous acid,		
Water, of each sufficient.		

Mix two and one-eighth troy ounces of the iodine with the iron wire and eight fluid ounces of water and set the mixture aside, stirring it up occasionally until complete combination has been effected. Decant the light green liquid, wash the residuary iron wire with two fluid ounces of water, and unite the washings with the first decantate. To this mixture now add the remaining iodine, and when it has wholly dissolved, gradually add the calcium carbonate, facilitating its decomposition towards the last by the application of a gentle heat. Then gradually add the ammonium bicarbonate, heat the mixture until effervescence has nearly ceased, and filter it when nearly cooled. Wash the residue on the filter with water until it is practically freed from ammonium iodide and unite the resulting filtrates. Boil this solution in an open dish until it shows signs of discoloration and add to it 20 minims of sulphurous acid, mixed with 40 minims of ammonia water. Now continue the evaporation at a boiling temperature until a crystalline magma has resulted. Then remove it to a water-bath and proceed with the condensation until a perfectly dry white salt is obtained. Should the salt have acquired free iodine afresh repeat the treatment with sulphurous acid and ammonia.—Amer. Jour. Pharm., July 1887, 335–340.

Hydriodic Acid—Improved Manipulation, etc.—Prof. Lothar Meyer points out that the drawbacks inherent in all methods hitherto used for preparing pure hydriodic acid may be avoided by simply observing the precaution to have *at all times* an excess of iodine present, and not, as is usually directed, to add iodine to excess of phosphorus. For every 100 parts of iodine nearly 5 parts of red phosphorus and 12 parts of water are required, a very concentrated hydriodic acid being the result. If a weaker acid is not objectionable, it is preferable to use 20 parts of water, 10 parts of which are introduced with the iodine; the other first addition of phosphorus magma to the iodine, contained in a tubulated retort with the neck turned upward, should under no condition, and irrespective of the quantity of material in operation, exceed *one drop*. The reaction, however slow, is sure to occur, and in the presence of more than one initial drop is sure to be followed by explosion. As soon as the first reaction has ceased, the phosphorus magma is added slowly by drops, the reaction being allowed to moderate after each addition before making another, and after a time larger quantities of magma may be added at once, so that, with 100 grams of iodine, the whole operation may be completed within about 15 minutes. Under these precautions, the whole reaction takes place quietly and requires no heat until near the end. The best form of receiver is a pair of Woulff's bottles connected by a syphon. In the first of them the delivery tube ends immediately below the cork, the gas being absorbed by the water with acidity. The amount of water in the receiver must be regulated by the desired strength of the product. Prof. Meyer obtained from 100 grams iodine, 5 grams phosphorus, and 35 grams water, altogether 95 grams of pure hydriodic acid (instead of the theoretical quantity of 100.8 gm.), of which 57.5 grams came over directly as gas, and the balance (37.5 grams) was distilled over in aqueous solution. When only 20 grams of water were used, 74.4 grams came over as gas, 23.7 by distillation, together 98.1 grams of pure hydriodic acid. For the specific details and precautions reference must be had to the original paper in Ber. d. D. Chem. Ges., 1888, 3, 381; or to the abstract in Amer. Drugg., April 1888, 71.

Iodides.—Mr. R. Rother gives formulas for preparing *Plumbic*, *Mercuric*, and *Mercurous Iodides*, and *Bismuth-oxyl-iodide*—which see under the headings of the respective metals.

Iodide of Potassium—Examination of Commercial Samples.—Mr. Geo. A. Curriden prepared some potassium iodide in the usual manner, by treating potassium hydrate with resublimed iodine, igniting the salt with charcoal, and crystallizing twice. To this sample, marked No. 1, the pharmacopœial tests for purity were applied, and four commercial samples, procured from manufacturers in New York, Philadelphia, St. Louis and Baltimore were examined in the same manner, giving the following results:

PHARMACOPŒIAL TESTS.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
For alkali with litmus paper.	Faint blue.	Deep blue.	Violet blue.	Violet blue.	Deep blue.
For iodate.	Clear; then yellowish.	Brownish.	Purplish blue immediately.	Purplish blue immediately.	Brownish
For chloride or bromide.	Clear.	Cloudy at once.	Cloudy and precipitate.	Cloudy and precipitate.	Cloudy at once.
For sulphate.	Clear.	Cloudy at once.	Clear.	Clear.	Cloudy at once.
Weight of AgI.	1.415.	1.368.	1.415.	1.300.	1.400.

The precipitated silver iodide was well washed, carefully dried, brought to the fusing point in a porcelain crucible, cooled and weighed. Of the commercial samples, No. 3 alone yielded the theoretical weight. The weight of iodide procured by the remaining three commercial samples being *less*, the difference was probably due to the presence of carbonate, sulphate and iodate, the amount of which impurities was not estimated.—Amer. Jour. Pharm., June 1888, 279; from the author's thesis.

Iodide of Potassium—Sulphite an Impurity.—Mr. C. Daudt has observed iodide of potassium containing sulphite as impurity. The sample responded to the pharmacopœial tests for iodate, nitrate, chloride and thiosulphate; but the hydrogen gas evolved on testing for nitrate with zinc and hydrochloric acid, produced a black color on lead paper, due to the presence of sulphite, soluble sulphides being absent. Am. Jour. Phar., 1888, 242.

Iodide of Potassium—Influence upon the Elimination of Mercury.—According to Dr. Souchow, the elimination of mercury commences later, and the quantity eliminated is relatively less in those cases in which the patient takes potassium iodide in conjunction with the mercurial preparation. If the iodide is administered during or after the mercurial course, the quantity of mercury eliminated daily is lessened. The iodide, therefore, appears to prevent the elimination of mercury, instead of hastening it, as has been believed by some, and would seem to be useful in cases of mercurial poisoning.—Boston Med. and Surg. Jour.; Jour. Am. Med. Assoc.; Amer. Jour. Pharm., March 1888, 146.

Iodide of Potassium—Liability to become Inert in the Stomach.—Mr. T. B. Boyd draws attention to the fact that iodide of potassium is liable to become inert in the stomach, unless the patient is caused to abstain from the use of starchy foods. He attributes the want of efficacy of the remedy observed in some cases to this cause.—Proc. Ala. Pharm. Assoc., 1888, 19–20.

Iodic Acid—Formation of Double Compounds with Chromic Acid.—See *Chromoiodates* under "Chromium."

Iodates—Tests for Iodates and Nitrates Obscured by Hyposulphites and

Sulphites.—In order to render illusory the usual tests for the presence of iodate and nitrate in iodide of potassium or sodium, some manufacturers have fraudulently added a hyposulphite. This fraud having been met by the requirement of the Germ. Pharm. to test for the presence of hyposulphite, these manufacturers, according to Mr. C. Daudt, have replaced the hyposulphite with sulphite, which effectually masks the presence of nitrate and iodate.—Drug. Circ., May 1888, 105; from Pharm. Ztg.

Iodate of Potassium—Preparation.—Mr. Soltrier prepares iodate of potassium by triturating iodine and permanganate of potassium in slight excess with water and heating the mixture. The filtrate must retain a slight but permanent rose-color. The iodate is crystallized out and the small quantities of hydrate of potassium formed are removed by washing with alcohol. The oxidation of iodide of potassium to iodate has been proposed by Hempel and Reinige, but the direct oxidation of iodine in this manner has not been hitherto practiced.—D. A. Apoth. Ztg., Dec. 15, 1887, 254; from Pharm. Ztg.

Iodine Trichloride—Antiseptic Uses.—Iodine trichloride is now put upon the market, being recommended as an efficient antiseptic and disinfectant, its efficiency being chiefly due to the readiness with which it liberates chlorine. It is an orange-red powder, the odor of which strongly irritates mucous membrane, and is best used in solution 1 to 1200.—Amer. Drugg., May 1888, 83.

FLUORINE.

Fluorine—Successful Isolation—Characters, etc.—Mr. H. Moissan describes in great detail the method by which he succeeded in isolating free fluorine by the electrolysis of hydrofluoric acid, containing fluoride of potassium, as also the character of fluorine. It is a colorless gaseous body, having a very unpleasant odor, reminding of hypochlorous acid. It combines with hydrogen in the dark, and thus constitutes the first example of two gaseous elementary bodies uniting without the influence of foreign energy. Sulphur, selenium, tellurium and phosphorus are ignited in contact with fluorine. Iodine unites with the gas with the production of a pale flame. Powdered antimony and arsenic combine with fluorine, becoming heated to white heat. Crystallized silicium burns with a bright flame, forming fluorsilicium. Potassium and sodium combine with the production of a white heat and formation of fluorides. Powdered iron and manganese, when slightly heated, combine with scintillation. Mercury absorbs fluorine completely, a yellow colored mercurous fluoride being formed. Gold and platinum are not attacked by fluorine at the ordinary temperature. Chloride of potassium and iodide of potassium are decomposed with elimination of the respective haloids. Water is decomposed by gaseous fluorine, with formation of hydrofluoric acid and of ozonized oxygen. Bisulphide of carbon is ignited and trichloride of carbon is decomposed with liberation of chlorine. Organic bodies containing hydrogen are violently attacked. A piece of cork is at once carbonized in the gaseous element and becomes ignited. Fluorine also has the effect of igniting alcohol, ether, benzol, oil of turpentine, and petroleum. These observations prove fluorine to possess a chemical affinity superior to all the other known elements; and by reason of this superior affinity it may become useful for important reactions.—Chem. Repert., Jan. 8, 1888, 2; from Ann. Chim. et Phys., 1887, 6 Sèr. 12, 472.

Fluorides—New Potassium Compounds.—Mr. Moissan has ascertained that fluoride of potassium is capable of forming several crystallizable compounds with hydrofluoric acid. The compound KF,HF, is already known, but Mr. Moissan shows the existence also of compounds having the formula KF,2HF, and KF,3HF, of which the latter is specially remarkable. It does not give off hydrofluoric acid even when placed in a vacuum, or when heated to 85°. It forms crystals which are very deliquescent, and which dissolve in water with production of intense cold, being decomposed into hydrogen and potassium fluorides. Exposed to a damp atmosphere the crystals emit acid fumes. If heated in contact with crystalline silicon there is vivid combustion, with violent disengagement of silicon tetra-fluoride gas.—Pharm. Era, May 1888, 178.

Sodium Silico-Fluoride—Preparation, etc.—Attention having been directed to the possible antiseptic value of certain fluorine compounds by Mr. W. Thomson, Mr. Frank H. Rosengarten, at the request of Dr. Thomas C. Morton, prepared some fluosilicate of sodium for his use, and now shows the salt to the college as a novelty not yet completely exploited. No doubt Dr. Morton will soon report on its antiseptic properties, though necessarily such results as pass the critical tests of surgery require extended time for observation. The salt is made by generating hydrofluosilicic acid, passing it into water, and then saturating the liquid with carbonate of sodium. There are some little inconveniences in its preparation, and care must be observed in the proper proportions of the materials used in the generation of the acid, as an excess of hydrofluoric acid is dangerous to the operator.

Should this salt prove to be all that has been said of it, no doubt the surgeon will gladly welcome it as a substitute for the various antiséptics so invaluable in the healing art. The use of iodoform and corrosive sublimate, carbolic acid, and the various compounds brought forward, would be lessened, and the disagreeable surroundings accompanying them be avoided.—Amer. Jour. Pharm., Dec. 1887, 606-607.

PHOSPHORUS.

Phosphorus—Formation of Crystals.—Mr. Herman recently exhibited before the "Society of Chemical Industry" some exceedingly curious specimens of phosphorus crystallized by slow sublimation in closed tubes from which the air had been extracted. The forms of the crystals belong to the cubic system like those of the diamond, and they are, like the latter, formed of a very large number of facets. Their action upon light is also similar to that exerted by the diamond, so that the crystals of phosphorus, small as they are, give out all the colors of the spectrum with great brilliancy. They are, in fact, like miniature diamonds. When exposed to the light, they become covered with an opaque red coating.—Drug. Circ., May 1888, 105.

Phosphorus.—Proper use for converting iodine into *Hydriodic acid*, which see under "Iodine."

Phosphide of Zinc—Value as a Substitute for Phosphorus.—Phosphide of sinc, according to recent experiments by Guidi, and by Canali and Betz, constitutes the best form in which to administer phosphorus, while it is easily divided, is stable and is well borne. Vigier recommends that the crystallized chemical be used in making the preparations; the dose should be equal to 1 to 3 mgm. of phosphorus *per diém*. The above-named investigators agree with Kassovitz (see *Moniteur Thérap.*, Nov. 7, 1887), as to the great value of phosphorus in rachitis. "In a very large number of cases cited, cure was complete; in others there was a notable amelioration, and the results were negative only when the medicament was not well tolerated or caused diarrhœa."—Amer. Jour. Pharm., March 1888, 140.

Phosphoric Acid—Volumetric Estimation.—Messrs. B. W. Cheever and E. R. Beal draw attention to the difficulties attending the volumetric estimation of phosphoric acid by reason of its ability to form three classes of salts, each of which may have its own distinct characteristic reaction towards an indicator, as acid, neutral or alkaline, while sometimes different indications give different reactions with the same salt. According to J. Bongartz (Chemical News, 51, 123), if free phosphoric acid to which methyl-orange has been added, is titrated with a solution of potassium hydrate until the orange color is changed to a pale yellow, di-acid phosphate of potassium is produced, for which the free phosphoric acid may be calculated. If now phenolphthalein is added, and the potassium solution is run in until the red color is produced, this is indicative of the formation of mono-acid phosphate of potassium. The authors record their experiments, which have established the correctness of this statement, and, finding that sodium hydrate may replace the potassium hydrate, recommend the following process for the volumetric estimation of *free phosphoric acid*. Add methyl orange to the acid and then titrate with a standard solution of sodium hydrate until the orange-red color is changed to a pale-yellow. Then add phenolphthalein, and continue the titration until the neutral point of the indicator. The difference between the results obtained with methyl orange will give the amount of phosphoric acid in combination, the methyl orange giving the free acid, the phenolphthalein the total amount present.—Pharm. Era, Nov. 1887, 398; from Proc. Mich. State Pharm. Assoc., 1887.

Phosphoric Acid—Volumetric Estimation.—Mr. G. Guerin proposes the following method of estimating phosphates in urine: To 50 c.c. of urine add 5 c.c. of solution of acetate of sodium containing free acetic acid, heat to boiling and add a 5 per cent. solution acetate of uranium in slight excess. After a few moments collect the precipitate on a filter, wash it until the washings no longer precipitate nitrate of silver, then transfer it to a small flask, together with the filter, and shake with 30 c.c. of water until the filter is completely disintegrated. To the mixture, heated to boiling, a standard solution of nitrate of bismuth is now added until a drop of the clear liquid gives a black precipitate with an alkaline solution of stannous chloride.

The bismuth solution is prepared by macerating 100 grams of the pulverized soluble nitrate in a litre of water until saturated, then filtering and determining its value by means of a solution of crystallized phosphate of sodium of known strength.—Pharm. Era, June 1888, 217; from Jour. de Pharm. de Lyon.

Glacial Phosphoric Acid—Preparation of a Pure Article.—It is stated in "Zeitschr. f. Anal. Chem." (1888, 24) that pure glacial phosphoric acid may be obtained from sodium pyrophosphate by treating it with fuming hydrochloric acid, spec. grav. 1.190, filtering through platinum sponge from the sodium chloride, removing arsenic by means of sulphuretted hydrogen, and evaporating in a platinum vessel. Sodium chloride is almost insoluble in hydrochloric acid of the above strength; a weaker acid will not remove the soda.

Glacial Phosphoric Acid—Determination of Sodium Phosphate.—Mr. Anton Bettendorff, during the course of an examination of glacial phosphoric acid, added some stannous chloride dissolved in fuming hydrochloric acid. He obtained a copious quantity of brilliantly white small crystals, which turned out to be chloride of sodium. In further studying this reaction he fouud that the chloride of sodium is thus precipitated out on account of its insolubility in fuming hydrochloric acid, and that this behavior is applicable to the determination of phosphate of sodium in the glacial acid, the addition of which is made to enable its being cast into sticks. If

Pure Glacial or Meta-Phosphoric Acid is required, reduce sodium pyrophosphate, previously ignited, to powder, treat it with hydrochloric acid of s. g. 1.190, separate the chloride of sodium formed, then remove any arsenic present in the residuary liquid, evaporate the liquid finally obtained in a platinum vessel, and ignite the residue.—Amer. Drugg., Feb. 1888, 33; from Zeitschr. f. Anal. Chem., 1888, 24.

Phosphates—Prevention of Change in their Solutions.—Mr. L. Jacquemain states that the glairy mass which is prone to form in solutions of lacto- and other phosphates is composed of micrococci, closely resembling the hygrococcus arsenicus of Marchant. He states that their development can be prevented by keeping the solution under a pressure of carbon dioxide, and that he has found this method well adapted both to the preservation of solutions of peptones and of the phosphates.—Drugg. Circ., March 1888, 57; from Petit Monit. de la Pharm.

BORON.

Boric Acid—Solubility by the Acid of Magnesia.—Mr. F. Cloez states that boric acid may be dissolved in five times its weight of water by the intervention of magnesia. The proportions are: Magnesia usta, 2 p.; boric acid, 31 p.; water, 150 p. The solution has the antiseptic properties of Oppermann's "Anti-fungin."—Pharm. Era, Nov. 1888, 411; from Pharm. Post, No. 29, 1887.

Boracic Acid—Method of Pulverization.—A writer in "Le Monde Pharm." (May 5, 1888), recommends the following method for reducing boric acid to fine powder: The acid is placed in a vessel with a sufficient quantity of boiling water to dissolve it. The mixture is then vigororously agitated with an egg-beater until it cools, when it gives a deposit of microscopical crystals. These are *partially* dried between sheets of filtering paper, and may then be quickly reduced to impalpable powder in the mortar. The quantity remaining in solution—which is very small —may be regained by evaporation, or the same liquid may be used again for the same purpose.—Amer. Jour. Pharm., June 1888, 289.

Boracic Acid—Innoxiousness.—Dr. Gaucher concludes from experiments upon animals that man would have to take 75 gms. in twenty-four hours to get its toxic effects. To several tuberculous patients he gave quantities equal to 1 gm. daily. After a few days of treatment the fetidity of the sputa disappeared, and in two cases the general condition was ameliorated. He found it beneficial in cystitis; it produced no gastric irritation.—Amer. Jour. Pharm., May 1888, 239; from Repert. de Pharm., March 1888.

Borate of Ammonium—Value in Phthisis.—Dr. Lashkevich has found this salt of great value in phthisis. He gives five grains three times a day, in solution, alone or with codeine, hyoscyamus, or some other sedative. The effect is to reduce the expectoration and, in some cases in the early stage, to diminish the fever. Inhalation of a spray of the solution also reduces the expectoration and alleviates irritating and painful conditions of the mouth and throat.—Amer. Jour. Pharm., Oct. 1887, 506; from N. Y. Med. Jour., Aug. 27.

Biborate of Ammonium—Use in Nephritic Colic.—Bi-borate of ammonium is reported as having been successfully used in cases of nephritic colic. The doses are given at 1 gm. 25 cgm. every two hours until easy micturition is obtained; and afterward every four hours until pain has ceased. Between the attacks 3 doses of 1 gm. each should be taken daily with meals, and the treatment should be continued for several months with interruptions of one or two weeks.—L'Union Pharm., Jan. 1888; Amer. Jour. Pharm., Mar. 1888, 140.

Borax—Commercial Quality.—Mr. G. E. Norton has examined five commercial samples of borax. All were found to correspond with the pharmacopœial description and requirements, except in the proportion of water of crystallization present, which amounts in the case of four samples of powder to 48, 50, 59 and 60 per cent. instead of the standard quantity, 47.1 per cent. A sample of effloresced crystals contained only 45 per cent. In some of the samples more chloride than is permitted was present.—Pharm. Era, Sept. 1887, 322.

CARBON.

Carbolic Oxide—Toxicology.—Mr. M. Gross communicates an interesting paper on the toxicology of carbonic oxide. While its action, when not at once and rapidly fatal, is only accompanied by transient indisposition, the repeated or continued influence—disturbance of the hearts' action—must necessarily give rise to permanent functional disorders. The author draws attention to the immense quantities of carbonic oxide that are continually distributed in the dwellings of large cities—and particularly in New York—by leakage of the gas conduits, and attributes the increase in the cases of lung and heart troubles during the past twenty-five years largely if not entirely to the inhalation of carbonic oxide from this source.—D. A. Apoth. Ztg., Oct. 15 and Nov. 1, 1887, 197–198 and 211–212.

Carbonic Acid—Value of its Aqueous Solutions for Burns.—A new remedy for burns, proposed by Mr. Dubois, consists in allowing the contents of a syphon of Seltzer water to flow slowly over the affected parts. It quiets the pain almost instantly, and the writer believes it hastens the final cure. He ascribes the good effect to the carbonic acid gas, and to the local lowering of temperature.—Amer. Jour. Pharm., Aug. 1887, 401; from Jour. de Méd. de Nantes, 1887.

Natural Gas—Composition.—Prof. C. C. Howard has determined the composition of the natural gas of the Findlay wells as follows:

Marsh gas (CH_4), 92.61; olefiant gas (C_2H_4), 0.30; hydrogen, 2.18; nitrogen, 3.61; oxygen, 0.34; carbonic acid (CO_2), 0.26; carbonic oxide (CO), 0.50; sulphuretted hydrogen, 0.20. One cubic foot of the gas weighs 319 grains, and contains 0.61 grain of sulphur.—Phar. Era, Dec. 1887, 446.

Bisulphide of Carbon—Value in Pulmonary Affections.—Dr. Guerra

Estape claims to have cured several cases of chronic bronchitis and one of consumption with this remedy. Experiments made upon himself seemed to show that the medicament was largely eliminated by the lungs; air from the lungs conveyed by means of a glass tube through Fehling's solution, gave a flocculent precipitate of sulphate of copper. The medicine gave rise to no unpleasant symptoms, and was effective when a mixture, as follows, was administered in doses of 15 gm. once daily: Sulphide of carbon, 25 gm.; water, 500 gm.; ess. menth., 30 drops. Patients were forbidden to use alcohol, it being liable, according to the author, to act upon the bisulphide in the blood, thus forming sulphuretted hydrogen.—Amer. Jour. Pharm., Oct. 1887, 489; from Nouveaux Remèdes, Aug. 8, 1887.

Thiophosgen—Characters.—This interesting body, which contains sulphur in place of the oxygen of the ordinary phosgen gas ($COCl_2=CSCl_2$), is now an article of commerce. It is described by Mr. H. Bergreen as a red, mobile liquid, which is slowly decomposed when exposed to moist air, and therefore produces copious fumes on opening the containing vessel. When exposed for several days in a long glass tube to the direct sun-rays, it was converted into a solid modification. In contact with cold water it is very slowly decomposed, but rapidly by boiling water.—Arch d. Pharm., April 2, 1888, 367; from Ber. d. D. Chem. Ges., 1888, 337.

CYANOGEN COMPOUNDS.

Cyanide of Potassium—Incompatibility with Chloral, which see under "Alcohols."

Cyanide of Mercury—Value in the Treatment of Diphtheria.—Dr. Bree reports 318 cases of diphtheria treated with mercury cyanide with only four deaths. At the outset he gives from two to three drops of a 1-to-1000 solution in alcohol, every four hours, afterward diminishing the dose progressively. The remedy is said to oppose the extension of the morbid process, and to ameliorate the subjective symptoms. In the course of a night, a threatening case has been so mitigated as to come to an end in three days. Thus involvement of the larynx or the nasal passages and the occurrence of sequelæ are prevented with almost absolute certainty, and the convalesence is shortened.—New York Med. Jour., July 23, 1887; from the Author's Inaug. Dissert.

Cyanide of Mercury—Value as a Remedy for Diphtheria.—Dr. Stellden has used cyanide of mercury in 1400 cases of diptheria since 1882, according to the following formula, and claims that the number of deaths has been only 69, or less than 5 per cent., while the mortality in the same district (in Sweden) had been over 92 per cent.: Cyanide of mercury, 0.02 gm.; tinct. aconite, 2 gm.; honey, 50 gm.; mix. Dose, a teaspoonful every 15, 30 or 60 minutes according to the age of the patient.

The throat should not be scraped, but a gargle of cyanide of mercury of 1 to 10,000 aq. menth. should be used every 15 minutes. The frequent small doses create, according to the author, a medium in which the diphtheretic bacillus cannot live.—Amer. Jour. Pharm., June 1888, 287; from L'Union Phar., April 1888.

ALKALIES.

Alkali Metals—Continuous Method of Manufacture.—According to Mr. Castner, the manufacture of alkali metals is now conducted by the following improved method: An intimate mixture of tar and iron is carbonized in such proportion that the resulting product contains about 30 per cent. of carbon. The pulverized carbon-iron is then heated with the alkali in moderate-sized crucibles, placed in the separate compartments of a walled distilling chamber, from the cover-plate of which a common conducting-tube leads the vapors of alkali metal, produced at about 1000° C., into the condensing apparatus. The new method has the advantage over the older one, that a continuous renewal of contact between the reducing agent—the finely divided coal, which by reason of being weighted maintains its position beneath, and the melted alkali—is established; the continual bubbling and flowing of the alkali securing an equable distribution of the heat among the contents of the crucible. The continuous action of the process is maintained by the removal of the crucible from the individual compartments and replacement by freshly charged ones. By the improved method it has become possible to produce 90 per cent. of the theoretical quantity of metal, whereas by the older one—heating of carbonated alkali with lime and charcoal—only about 53 per cent. was obtained.—Arch. d. Pharm., Sept. 1887, 835; from Journ. Pharm. Chim., xvi., 74.

Sulphate of Ammonium—Improved Process of Preparation.—Mr. Croll has devised an improved form of apparatus for the preparation of ammonium sulphate from the refuse in gas manufacturing, that renders possible a very material increase in the output at a very small expense. The apparatus employed consists of a column containing a series of superimposed shallow basins, about 76 to 100 mm. distant from each other, with one hole pierced through the bottom of each. These basins are arranged in such a manner that the contents of a basin dropping in the one beneath flows across its entire diameter before dropping into the next. The ammoniacal water having arrived at the top of the column, descends from one basin to another in the same manner as in Coffey's column. The new column, however, differs from that of Coffey in that the holes in the basins permit of the passage of the gases produced in the combustion in the furnace. These products are compelled to pass through the column and come in contact with the gases liberated from the ammoniacal liquid. This continues until the gases reach the top and pass into the saturator, where the ammonium sulphate is formed. To force the gases to traverse the column and the saturator, an exhaust fan is used, and if necessary a blower may also be employed. In this process the acid vapors disengaged in the combustion, such as sulphocyanic, sulphurous, etc., and the volatile sulphides, are decomposed into sulphuric acid, which being brought into contact with the ammoniacal water in the column described above and in the saturator, combines with the ammonia, forming ammonium sulphate. In a small apparatus attached to the gas works at Kilkenny, a practical trial gave thoroughly satisfactory results, and no odor whatever of hydrogen sulphide was perceptible at the close of the operation.—Drugg. Circ., April 1888, 83; from Moniteur Industrielle.

Potassium—Alloy with Sodium.—Mr. A. Joannis has experimented with mixtures of potassium and sodium corresponding to the following proportions: Na_2K, NaK, NaK_2, and NaK_3. The thermo-chemical experiments lead to the result that the only alloy of the two metals, the existence of which can be regarded as established, has the composition NaK_2.—Chem. Repert., Jan. 8, 1888, 2; from Ann. Chim. et Phys., 1887, 6 Sér., 12, 358.

Potassium Hydroxide—Respecting the Occurrence of Potassium Nitrite.—Referring to the observation of Professor Dunstan (see Proceedings 1886, 499), that commercial caustic potassa quite frequently contains nitrite of potassium as impurity, Professor Frederick B. Power communicates the results of an examination of different specimens, which point out the fact that the potassium hydroxide of our principal American manufacturers is relatively quite free from nitrate. In view of the fact, however, that manufacturers are said to add potassium nitrate to both potassium and sodium hydroxides for the purpose of decolorizing the product, the author considers it desirable that a test for both *nitrites* and nitrates be embodied in the text of the next Pharmacopœia, as has been suggested by the German Pharmacopœia Commission. This test might read as follows: If 1 part of potassa be dissolved in 20 parts of diluted sulphuric acid, and 2 volumes of this solution be mixed with 1 volume of concentrated sulphuric acid, the subsequent addition of 2 volumes of solution of ferrous sulphate, without agitation, should produce no brown zone at the line of contact of the two liquids (absence of *nitrates* and *nitrites*).—Pharm. Rundschau, April 1888, 81–82.

Potassium Carbonate—Commercial Quality.—Mr. G. E. Norton has examined three commercial samples of carbonate of potassium. Two of the samples contained more than traces of chlorides, one of them 2.98 per cent. In all other respects the samples came up to the requirements of the Pharmacopœia.—Pharm. Era, Sept. 1887, 322.

Carbonate of Potassium—Reaction with Nitrate of Silver.—Dr. L. C. Marquart observes that when testing carbonate of potassium with silver solution according to the Ph. G., II., frequently a gray to brown-black, instead of a yellow (not white), precipitate is produced. This nut-brown precipitate, however, is not sulphide of silver, but pure oxide. Its color is determined by the temperature. If the solutions are both cold, the yellow-colored precipitate is obtained, but if warmed to 17° C. or over, the darker colored precipitates are produced. As is well known, the solution of carbonate of potassium is always attended with a rise in the temtemperature.—Arch. d. Ph., April 1, 1888, 313.

Nitrate of Potassium—Detection in Chlorate of Potassium.—Mr. Jorrisen recommends the following simple method for detecting nitrate in chlorate of potassium: Shake one gram of the finely powdered salt in a test tube with 10 c.c. of water, after a few moments decant the clear solution into another tube, add three drops of strong acetic acid and a fragment of pure zinc, and let stand for five to ten minutes. The nascent hydrogen evolved in the reaction of the zinc upon the acid, reduces any nitrate into nitrite, which, after removing the zinc, is indicated by the gradual development of a yellow to deep brown color on the addition of Griess' reagent (hydrochlorate of meta-diamido-benzol). The test permits the detection of very small quantities of nitrate.—Pharm. Era, Nov. 1887, 407; from Jour. Pharm. d'Anvers.

Bicarbonate of Sodium—Method of Accelerating the Absorption of Carbonic Acid.—Mr. Mondésir states that the process of converting carbonate into bicarbonate of sodium is materially hastened if the calcined sal soda, after the addition of 1 equivalent of water, is mixed with a few per cent. of bicarbonate of sodium before passing the carbonic acid over it.—Arch. d. Pharm., Sept. 1887, 835; from Jour. Pharm. Chim., xvi. 81.

Supercarbonate of Sodium—Artificial Production.—The compound occurring naturally and known under the names of *Trona* or *Urao*, which contains 4 mol. of carbonic acid to 3 mol. of soda, has been obtained accidentally by Mondésir, by artificial means. Engaged in the production of salt from salt well-brine which contained besides alkaline earths, principally chloride and carbonate of sodium, he noticed a cessation of the crystallization when a certain concentration had been reached. His endeavor to wash out the carbonate of sodium, after further concentration, failed, and he finally found that the trouble arose from the presence of a supercarbonate having the composition $3Na_2O,4CO_2,5H_2O$. The separation of this compound was finally readily effected by boiling the salt mixture with water, decanting the solution from the undissolved salt, and cooling, when the supercarbonate rapidly crystallizes out in very fine, felty needles.—Arch. d. Pharm., Nov. 1887, 1021; from Jour. d. Phar. et d. Chim., xvi, 217.

Chloride of Sodium—Observation of Ammonium Chloride as Impurity.—

Dr. W. Kubel calls attention to the observation that a sample of chloride of sodium, which proved to be tolerably free from the most common impurity, chloride of magnesium, contained considerable quantities of chloride of ammonium. It is quite possible that the ammonium salt present was derived from the addition of ammonia, added for the purpose of removing the magnesium salt during the process of purification. Arch. d. Pharm., May 1888, 440–441.

Chloride of Sodium—Value in Migraine.—Dr. Batom reports six cases of hemicrania cured by giving from one-half to one teaspoonful of table salt dissolved in a wine-glass of water. It should be given on the appearance of the first symptoms, when it generally aborts the attack; when the seizure is established, also, it gives way very rapidly to this treatment. The author thinks the remedy will be of especial value when the trouble arises from gastric disturbances. He ascribes the results to the reflex action caused by the salt—the same explanation given by Nothnagel concerning the value of salt in epileptic seizures.—Amer. Jour. Pharm., April 1888, 180; from Bull. Gén. de Thérap., Feb. 29, 1888.

Cod fish Salt—Notable Therapeutic Value.—Mr. Langlebert has made researches on the probable therapeutic value of baths composed of salt, which has been previously used in fishing vessels for the temporary preservation of cod-fish. He finds in this salt a considerable amount of azotized material in the forms of methylamine, dimethylamine, and trimethylamine, and he concludes from his observations that the presence of these substances in cod-fish salt, united to the therapeutic action of the salt itself, offers a compound worthy of the consideration of therapeutists. —Jour. de Pharm. et de Chim., Jan. 1, 1888.

Soda Saltpetre—Formation by the Agency of Micro-Organisms.—The investigations of Muntz and Marcano have determined that the formation of saltpetre in the immense South American deposits is due to the agency of a micro-organism, which they designate as the saltpetre ferment. This acts by oxidizing the nitrogen of organic substances, possibly a guano deposit originally, which, having been covered by sea water, is during the evaporation of the latter in the proper condition and composition favorable to the change. The authors' experimental results confirm this view very strongly.—Arch. d. Pharm., Nov. 1887, 1026; from Jour. Pharm. Chim., xvi., 267.

Lithium Salts—Manufacture.—The following method is that adopted by E. Schering for the manufacture of lithium salts from lepidolite: the mineral is finely powdered and sifted, transferred to a basin of stone-ware situated so as to be surrounded by warm air, then mixed to a thin magma with concentrated sulphuric acid, and digested until the mass becomes lumpy. It is then calcined on a hearth, and, while still warm, completely lixiviated with water. Before the resulting solution is evaporated, it is mixed with enough sulphate of potassium to combine with the aluminium present as alum. During the evaporation the latter separates as a fine precipitate, which is removed, and any alum that may finally remain in solution is decomposed by milk of lime. After filtering and washing, the united liquids are mixed with chloride of barium, whereby all the bases present are converted into chlorides, while sulphate of barium falls down. The whole mixture is then evaporated to dryness, and the residue extracted with absolute alcohol. The alcohol is recovered from the solution by distillation, the calcium salt is decomposed by oxalate of ammonium, and any contaminating metals are removed by sulphide of ammonium. The filtrate is again evaporated to dryness, and almost absolutely pure

Chloride of Lithium is extracted by absolute alcohol, which leaves it as residue on distillation. To convert this into

Carbonate of Lithium, which is the starting point for all other lithium salts, the chloride is divided in a small quantity of water, and precipitated with carbonate of ammonium and water of ammonium. The resulting carbonate of lithium is finally washed with alcohol of 60 per cent, whereby the remaining traces of chloride may be removed.—Amer. Drugg., April 1888, 62.

ALKALINE EARTHS.

Barium Hydrate—Preparation in Quantities.—Lucien communicates various methods for preparing barium hydrate on an extensive scale, to meet the demand for this compound by sugar refiners. A good method consists in mixing carbonate of barium with 50 per cent. of good charcoal, carefully removing moisture by drying, and heating the mixture in quantities of 600 kg. at a time, in a puddling furnace. A strong draft is necessary to secure the required temperature (1100°), since the mass is a bad conductor of heat. Under favorable conditions from 85–90 per cent. of the $BaCO_3$ is converted into $Ba(OH)_2$, the melted mass containing (after 5 or 6 hours) from 60–70 per cent. of the latter. A second method used to some extent in recent years, is that of Radot, which consists in heating $BaCO_3$ containing 40 per cent of moisture in a current of burning hydrocarbons (obtained from coal-tar) to redness. The reduction is not as complete as in the first method, only about 30 per cent. $Ba(OH)_2$ being obtained. A third method consists in the reduction of sulphate of barium by heating 4 to 5 hours with 35 per cent. of coal. The reduction to sulphide takes place at a lower temperature, so that a muffel furnace can be used. The sulphide is converted into oxide by the agency of zinc oxide. The loss here also is considerable.—Chem. Repert, Jan. 15, 1888, 20; from Bull. Ass. Chem., 1887, 6, 444.

Baryta.—Insoluble compound with starch, and application to the estimation of the latter. See *Starch* under "Organic Chemistry."

Sulphide of Barium—Preparation for Making Pure Hydrosulphuric Acid Gas.—Mr. Clemens Winkler recommends sulphide of barium as a convenient source of hydrosulphuric acid gas, particularly when it is wanted absolutely free from arsenic. The kind of sulphide of barium suitable for this purpose is made as follows: 100 parts of sulphate of barium and 25 parts of powdered charcoal are finely ground together, 20 parts of chloride of sodium are added, and a little water is then added to form a slightly damp mass, which is tightly packed into clay crucibles. The crucibles and contents are dried with a moderate heat, some coarsely powdered charcoal is put on top of the mass, and the lid is luted on with clay, a small hole being left for the escape of gases. The crucibles are then heated for several hours to an incipient white heat, after which the heat is gradually moderated, and the crucible taken from the furnace and allowed to cool. On turning them over, the partly fused cones of sulphide drop out. They are broken into fragments by the strong blows of a hammer, and are preserved in tightly closed vessels—tin boxes answer well—in a moderately warm place.—Amer. Drugg. Febr. 1888, 32–33; from Zeitschr. f. Anal. Chem., 1888, 26.

Barium Bromide—Preparation and Use for Making Hydrobromic Acid, which see under "Bromine."

Barium Chlorate—Decomposition by Heat.—Mr. A. Potilitzin records the results of experiments made to determine the nature and rapidity of changes resulting upon heating certain compounds of the haloid-oxygen acids. At 330°–400° barium chlorate is decomposed according to the equation: $2\ Ba\ (Cl\ O_3)_2$—$Ba\ Cl_2 + Ba\ (Cl\ O_4)_2 + 4O$. The decomposition at first is accelerated, and then gradually is lessened if a uniform temperature is maintained, until finally it ceases, when 11.09–11.6 per cent. of oxygen have been given off. The residue contains, besides barium chloride and barium perchlorate, about 0.1 per cent. of barium oxide.

Barium Perchlorate is decomposed with the same regularity. It crystallizes with 3 mol. (not with 4 mol.) of water; 2 mol. being removable in the exsiccator, the third by heating at 100°. The *pure* salt is not hygroscopic; if so, it is due to the presence of perchloric acid, which is difficult to remove. The decomposition of the perchlorate begins at 400°, and is completed at 460°, at which temperature all the oxygen is eliminated.

Barium Bromate ($Ba\ (BrO_3)_2H_2O$), on the other hand, begins to decompose at 260°–265°; at 300°–305° it crepitates suddenly, bromine vapors are evolved, and it delapses to a fine powder; on continuing the heat at the same temperature, the decomposition goes on regularly. The author assumes that in the case of bromate of barium, this is changed by heat into two isomeric salts having different stability, thus accounting for the sudden decomposition observed during a certain stage of the heating; the more stable isomers being decomposed regularly to the last.—Chem. Repert. (Chem. Ztg.), Jan. 15, 1888, 13; from Russ. Phys. Chem. Gesellsch., 1887, 19, 339.

Lime.—Remarkable deposit on the trunk of *Hieronyma alchorneides*, which see under "Materia Medica."

Lime—Antiseptic Action.—Dr. Liborius has investigated the action of lime on microbial life. An aqueous solution in the proportion of 0.0074 per cent. destroyed, in a few hours, the typhus microbe, while a solution of the strength of 0.0246 per cent. destroyed in the same time the cholera bacillus. Beef-tea cultures of the cholera bacillus, which were mixed with albuminous matter in such a proportion as to resemble natural cholera dejections, were permanently and completely disinfected by the addition of 0.4 per cent. of pure caustic lime, or 2 per cent. of crude burnt lime. As powerful an effect was produced, even under still more complex conditions, by the use of the pure powdered lime, or of a milk of lime prepared with 20 per cent. of the antiseptic. These important results show that the popular belief in the disease preventing power of lime is not without foundation.—Drugg. Circ., Nov. 1887, 249; from Ztschr. f. Hygiene.

Precipitated Chalk—Hyposulphite of Sodium and Calcium an Impurity.—Mr. F. H. Alcock draws attention to an unusual impurity in a parcel of precipitated chalk. It consisted of considerable traces of hyposulphite of sodium with a little of the calcium salt. He conjectures that the particular sample of precipitated chalk was an imperfectly washed by-product obtained in the manufacture of hyposulphite of sodium from the hyposulphite of calcium produced in making carbonate of sodium by the Le Blanc process.—Pharm. Jour. and Trans., March 24, 1888, 804.

Phosphate of Calcium—Suitable Preparation for Lactophosphate.—Mr. Ad. Kopp, in view of the difficult solubility of bibasic phosphate of calcium in dilute acids, recommends the gelatinous tribasic phosphate of calcium for the preparation of lactophosphate of calcium, prepared as follows: A solution of chloride of calcium is precipitated with the proper quantity of phosphate of sodium in presence of ammonia in excess. The magma is well washed, the greater part of the water is removed by expression, and to prepare the

Lactophosphate of Calcium, the moist magma is now dissolved in lactic acid. The nearly neutral solution (which is rapidly produced) is at once filtered to prevent the separation of the lactophosphate formed, and on standing will separate the lactophosphate in crystalline form. The magma is collected on linen, pressed and dried.—Chem. Repert, Dec. 11, 1887 297; from Jour. de Pharm. d'Als. Lorr., 1887, 156.

Magnesia.—Objection to its use in making *Pills*, which see under, "Pharmacy."

Anhydrous Chloride of Magnesium—Preparation.—The preparation of anhydrous chloride of magnesium has heretofore been connected with great technical difficulties. It is well known that this salt is one of the most hygroscopic substances known, and parts with its absorbed water only with the utmost difficulty. Mr. Walter Hempel has now found that by passing a current of hydrochloric acid gas through a dense aqueous solution of chloride of magnesium, the whole of the water may be removed. On a small scale this may be done by placing the salt in a crucible with perforated cover, through which the current of acid gas is passed, while the crucible is heated.—Amer. Drugg., May 1888, 94; from Ber. d. D. Chem. Ges., 1888, 897.

Magnesium Salicylate.—Preparation and character, see *Salicylate of Magnesium*, under "Organic Chemistry."

ALUMINIUM.

Aluminium—Electrolytic Method of Production.—Messrs. Gehe & Co. observe, respecting the electrolytic method of preparing aluminium, that this method has not yet been brought to such a point that the metal can be sold at materially reduced prices. At present, aluminium is chiefly used in the manufacture of bronzes and for physical and optical instruments, being here usually alloyed with a little silver. If it should, however, be possible to bring the cost of preparing it down to about 1 dollar per kilo, its employment would become so universal that it would revolutionize the metal industry.—Amer. Drugg. June 1888, 106; from Gehe & Co's. Handelsbericht, April 1888.

Aluminium—New Process of Reduction.—The following method for extracting aluminium has been patented in France: A mixture of powdered alumina and carbon is prepared by mixing the former with 40 per cent. by weight of powdered charcoal or lampblack, and a sufficient quantity of any oil or tar is added to form a thick paste. This paste is subjected to a red heat. By the resulting decomposition of the tar or oil, an intimate admixture of the carbon with the alumina is ensured, and the coherent mass of aluminous carbon thus obtained is broken up into small pieces. The pieces are placed in a closed vessel, into which a current of gaseous carbon disulphide is conducted. Reaction ensues, with liberation of carbonous oxide, which is conveyed away. The "sulphuret of aluminium" thus obtained is raised to a red heat in a closed vessel, and saturated with a current of "carbonated hydrogen." The latter unites with the sulphur, producing sulphuretted hydrogen, and leaving the pure aluminium.—Drugg. Circ., Dec. 1887, 273.

Aluminium—Use for Electro-plating.—Mr. Herman Reinbold gives the following recipe for an aluminium plating bath: Fifty parts of potassa alum are dissolved in 300 parts of water, and to this 10 parts of aluminic chloride are added, the liquid is heated to 200° and cooled, and 39 parts of cyanide of potassium are added. The object to be plated must be absolutely freed from grease. It is suspended in the bath over the electropositive electrode, the plate of metallic aluminium being suspended on the negative pole. The electric current ought to be weak. The plating when polished will be found to be equal to the best silver plating, having the advantage of not being oxidized or getting black from sulphurous vapors.—Drug. Circ., Nov. 1887, 249; from Jeweler's Jour.

Aluminium—Practical Hints.—Aluminium is at the present time made in such quantities, and so cheap, that its technical use will become greatly extended. It has, however, some peculiarities which must be understood to render its practical use successful. When aluminium is to be melted, to make a casting, for instance, this must not be done in a clay crucible, since it reduces the silica contained therein to silicium, whereby it becomes brittle. Graphite crucibles are the best, but a lime crucible may be used. A clay crucible lined with carbon, or well-ignited cryolite, may also be used. A good solder for aluminium is made by melting together 5 parts of zinc, 2 parts of tin and 1 part of lead, and rolling this out into thin sheets. The aluminium surface to be soldered must be scraped clear of all oxide, and coated with paraffin. A piece of solder is then placed upon each portion and heated. This causes the paraffin to melt; on further heating the solder melts and unites with the aluminium. The two surfaces thus coated are then soldered together in the usual manner.—Amer. Drugg., Feb. 1888, 23.

Rubies—Artificial Production.—Messrs. Frémy and Verneuil report to the "Académie des Sciences" (Feb. 27, 1888) important improvements in their production of artificial rubies. The process as announced a year ago, consisted in the reaction at high temperature of barium fluoride upon alumina containing traces of bichromate of potassium. The crystals were lamellated and friable. By recent changes in manipulation, hard and regularly formed crystals are obtained, perfectly transparent and of great brilliancy. Mr. Des Cloizeaux, the mineralogist, stated to the Academy that these crystals were identical with those of naturally formed rubies. The authors will continue their experiments on a more extended scale.—Amer. Jour. Pharm., June 1888, 289; from Monit. Sci., April 1888.

Sulphate of Aluminium—A new Basic Compound.—Mr. Carl Böttinger adds another basic sulphate of aluminium to the number already known. It has the composition of $Al_2O_3,SO_3+6\ H_2O$, and differs from natural basic sulphate, or aluminit, only in containing 3 mol. less of water. It is obtained by allowing sulphate of aluminium, chloride of sodium and water to react upon each other in glass tubes at a temperature of 130° to 140° for 2 to 3 hours, when the basic compound will separate in the form of a heavy white powder. The aqueous portion contains free hydrochloric acid and sulphate of sodium. The new basic compound loses only traces of water when heated at 100°, but when heated to faint redness it loses 2 mol. of water; at a bright red heat also sulphuric acid. It is insoluble in water and in acetic acid, very sparingly soluble in hot hydrochloric acid, but very easily in warm lye.—Arch. der Pharm., May 1888, 459; from Liebig's Annal. Chem., 244, p. 224.

MANGANUM.

Manganese—Precipitation as Sulphide.—Mr. C. Meineke finds that the precipitation of manganese as sulphide possesses notableadv antages over its separation by halogens or by peroxide of hydrogen and ammonia. Among other advantages, lime and magnesia are completely eliminated. It is necessary that the manganese should be separated as green, not as red sulphide, which is secured as follows: The boiling solution is treated with a large excess of ammonia, and sulphide of ammonium is then added. The mixture is boiled 5 minutes, and the green sulphide of manganese collected in a filter, etc., etc. The small proportion of manganese retained by the solution is insignificant, and the error no greater than by the usual methods.—Chem. Repert (Chem. Ztg.), Jan. 29, 1888, 29; from Ztsch. f. angew. Chem., 1888, 3.

Biniodide of Manganese—Uses, etc.—This salt has recently been recommended in medical journals in the treatment of amenorrhœa, given in the form of pills, containing 2 grains each. A formula for the preparation of this so-called biniodide has not been given; very likely the *manganous iodide*, MnI_2, also known as *protiodide*, is intended. This compound is as difficult to prepare and keep in the solid state in an unaltered condition as the corresponding iron compound, and like the latter is best administered in the form of syrup, for which the late Prof. Procter published a good working formula in 1850 —Amer. Jour. Pharm., Aug. 1887, 397.

Manganic Oxide.—Removal from flasks, burettes, etc., by *Nitro-sulphuric acid*, which see under "Nitrogen."

Manganese Tetroxide—Production, Characters, etc.—Mr. B. Franke obtained by passing air saturated with water-vapor over the compound $(MnO_3)_2SO_4$ a blue gaseous body, resembling ozone in its odor, but distinguished from ozone in being absorbed by concentrated sulphuric acid. This blue gas is one of the higher oxides of manganese, presumably the tetroxide MnO_4. To obtain it, carbonic acid saturated with water vapor is passed over manganese oxysulphate solution in such manner that the gas-delivery tube nearly touches the surface of the solution. The gases are allowed to escape through two U-tubes. In the first U-tube some MnO_3, which is carried over, is condensed; in the second U-tube, containing fragments of chloride of calcium or recently ignited fire-clay (which have the power of absorbing any water that is still retained by the CO_2), upon which a blue-violet, amorphous body condenses, which is soluble in water with evolution of oxygen, and forming a light red liquid containing manganic acid. The vapor of the tetroxide has a dark blue color, while that of MnO_3 is violet. The tetroxide may be collected under water, by which it is not decomposed until shaken for some time, with formation of oxygen and manganic acid.—Arch. d. Pharm., Oct. 1887, 925; from Jour. Prakt. Chem., 36, 166.

Potassium Manganate—Preparation for Analytical Purposes.—Mr. A. Jolles recommends the following method for preparing pure potassium manganate, which salt he finds to possess some advantages over the permanganate in certain oxidimetric processes: Chemically pure permanganate of potassium and caustic potassa (purified by alcohol), in the proportion corresponding to the equation—$2 (KMnO_4) + 2KHO = 2 (K_2MnO_4) + O + H_2O$—are heated in a crucible, the caustic potassa being first placed into the crucible, a little distilled water added, and then the finely pulverized permanganate under gradual heating and stirring. After heating the mass to faint redness for about two hours, the crucible is allowed to cool, and the manganate produced is at once placed into a well closed flask to avoid all contact with air, as well as such organic substances as cork, paper, etc., which would cause decomposition.—Arch. d. Pharm., Nov., 1887, 970; from Rep. d. Anal. Chem. 1887, No. 33.

Potassium-Manganidoxalate—Preparation and Characters.—According to Mr. F. Kehrmann, a new compound, potassium-manganid oxalate $K_6Mn_2(C_2O_4)_6+6Aq$) is produced as by-product when solutions of permanganate of potassium are reduced in the cold by oxalic acid; but the solutions of the new compound are rapidly reduced by further action. If, on the other hand, manganese superhydroxide is made into a paste with snow or finely reduced ice, and the calculated quantities of monopotassium oxalate and oxalic acid are added under constant stirring, the oxide dissolves to form a deep purple-red liquid, from which crystals of the new compound sometimes separate during the operation. The rapidly obtained filtrate is mixed with well cooled alcohol until crystallization begins, and the mixture is then placed for 1–2 hours in a freezing mixture of ice and salt. At the ordinary temperature and in the absence of light the crystals are tolerably permanent; direct sunlight decomposes them rapidly.—Arch. d. Pharm., Aug. 1887, 138; from Ber. d. D. Chem. Ges. xx., 1594.

Manganate of Lead—A New Bleaching Agent.—Which see under "Lead."

FERRUM.

Iron—Electro-Deposition.—Prof. Roberts-Austen is experimenting on the electro-deposition of iron. The bath used is a solution of ferrous sulphate and magnesium sulphate in equivalent proportions, of specific gravity 1.155. The solution must be so far neutralized by the addition of magnesium carbonate that blue litmus paper scarcely shows any acid reaction. A wrought-iron anode, about the same size as the object to receive the deposit, must be employed, and the best interval between the poles is found to be four centimeters. It has been found that the current best suited for an iron medallion had a strength of only 0.089 ampere. It was provided by two Smee cells, coupled up for intensity. The deposited metal is very pure, and its magnetic capacity does not appear to be high. The dies for the Jubilee coins were made by this process of electro-deposition. The designs, modeled in plaster, were reproduced in intaglio by the electrolytic deposit of copper, and on the copper moulds so prepared iron was deposited. It is of hard and excellent quality, and dies of all sorts for coins have been produced by the reducing machine from such deposits.—Drugg. Circ., Dec. 1887, 273; from "The Ironmonger."

Iron—Determination in Pharmaceutical Preparations.—Dr. C. Schacht, referring to the methods of Strohmeyer and of Mylius (see Proceedings 1887, 62 and 63), for determining the iron in "ferrum oxydatum saccharatum solubile," recommends the shortening of the process by carrying out the entire reaction in the same glass vessel—a stoppered flask—to the end. The author gives numerous examples, embracing nearly all the pharmaceutical iron preparations, illustrating the accuracy of the method.—Arch. d. Pharm., October 1887, 907–910.

Reduced Iron—Tests for Purity.—Mr. A. Kremel recommends the following two tests for determining the purity of reduced iron as being the best hitherto proposed:

1. *Wilner's Test.*—0.3 grams of the reduced iron is digested in a water bath for one hour with 50 grams of a five per cent. solution of bichloride of mercury, heated in a current of carbonic acid gas, and allowed to cool. Water is added up to 100 c.c. and the mixture allowed to stand; 25 c.c. of the clear liquid, after the addition of 5 c.c. of diluted sulphuric acid, must need not less than 38 c.c. of solution of potassium permanganate (1 to 1000) for oxidation. This corresponds to 89.75 per cent. metallic iron.

2. *Vulpius' Test.*—5 grams crystallized, chemically pure sulphate of copper are dissolved in 25 c.c. of distilled water, 1 gram of reduced iron is added and 2 drops of diluted sulphuric acid. The mixture is allowed to stand for an hour at ordinary temperature, shaking occasionally. The amount of reduced copper will be proportionate to the amount of metallic iron present, while the oxides will be without influence. Filter off into a tared, perfectly dry flask of about 75 c.c. capacity, wash the residue well, and precipitate the copper remaining in the filtrate with powdered iron, which must not contain more than one per cent. of matter insoluble in hydrochloric acid. After an hour all the copper will have

precipitated, and the liquid lost its blue color. On adding 5 grams of concentrated sulphuric acid and boiling, all the metallic iron in excess will be dissolved, leaving the copper intact. Wash the copper repeatedly with hot water, rinse well with alcohol and ether, and dry it quickly in the flask and weigh. Five grams of crystallized sulphate of copper correspond to 1.272 grams metallic copper; deduct the copper found by the last operation, when the amount of copper which corresponds to the metallic iron present will be found. 63.5 Cu indicate 56 Fe.—Drugg. Circ. May 1888, 106; from Pharm. Zeitschr. f. Russl.

Reduced Iron—Examination of Commercial Samples.—Mr. Orville S. Creighton has examined ten commercial samples of reduced iron as to their purity. Nos. 3 and 4 were of American, No. 7 of German, and No. 8 of French manufacture; the remaining samples were obtained from retail and wholesale stores, but the names of the manufacturers were not ascertained. The results tabulated are as follows:

		Iodine test.		Dilute H_2SO_4.		Dilute HCl, gas passed through		Aresnic by Reinsch's test.
	Color.	Filtrate.	Starch paste.	Sol'bty	Gas.	Cd. sol.	Ag. sol.	
1	black	red	blue	residue	nearly odorless	clear	darkened	decided trace
2	"	"	"	"	"	"	"	"
3	greyish-black	pale red	light blue	"	odorless	"	slight	slight trace
4	"	"	"	"	"	"	clear	none
5	black	red	blue	"	n. odorless	"	darkened	strong reaetion
6	greyish-black	pale red	light blue	"	odorless	"	clear	none
7	"	tinted	not blue	"	"	"	"	"
8	black and red	dark red	blue	"	n. odorless	trace of S.	darkened	decided trace
9	greyish-black	tinted	not blue	"	odorless	clear	clear	none
10	"	red	blue	"	n. odorless	"	darkened	decided trace

—Amer. Jour. Pharm., Dec. 1887, 609.

Reduced Iron—Examination of Commercial Samples. See *Pills of Reduced Iron*, under "Pharmacy."

Ferrous Iodide—Tonic and Alterative Properties.—According to Dr. Delmis, iodide of iron belongs to those preparations of iron which possess the best "tonianaleptic" properties, combining the strengthening iron and the alterative iodine effects. Its efficacy is seen in chlorosis and anæmia, and it is of the highest value in tuberculosis, scrofulosis, and syphilis. Iodide of iron is easily soluble and soon passes into the blood, where it is rapidly split up and eliminated. In the urine the iodine appears quickly as sodium iodide; the iron, as iron oxidé, is excreted more slowly. It is excreted as iodide of iron by the saliva, the milk, the sweat, and the bronchial mucus.—Amer. Jour. Phar., March 1888, 146; from Progrès Méd.

Ferric Chloride—Formation of an Acid Crystalline Salt.—Mr. Sabatier describes the compound Fe_2Cl_6, $2HCl$, $4H_2O$, which he obtained in form of rectangular, transparent, yellow-brown, very deliquescent crystalline plates, by passing gaseous hydrochloric acid into crystals of ferric chloride. The crystals separate from the greenish-yellow solution upon strong cooling.—Arch. d. Pharm., Nov. 1887, 1026; from Jour. Pharm. Chim., xvi., 272.

Ferric Salts—Unreliability of the Ferrocyanide Test.—Mr. Marguerite-Delacharlonny says that under some circumstances the ferrocyanide test for ferric salts may be uncertain, because it fails to detect the minute quantities of iron, and because it sometimes indicates the presence of iron where it does not exist. Thus, sulphuric acid alone is able to produce that precipitate of Prussian blue in a solution of ferrocyanide of potassium, which is considered a reaction characteristic of ferric salts. This reaction the author states is due to the partial decomposition of the ferrocyanide, which liberates a portion of the iron, which reacts with the undecomposed ferrocyanide with the formation of a precipitate of Prussian blue. According to Delacharlonny, the reaction with sulphocyanate of potassium is the most reliable test for ferric salts. It has been stated as an objection to this reagent that the characteristic color is produced by various substances—according to Wurtz, by sulphuric, nitric, hydrochloric, phosphoric, acetic, and oxalic acids, by oxygenated water, and by chlorine water. Regarding this objection, Delacharlonny says that the production of the color in these cases is due to the presence of minute traces of iron. By the repeated distillation of nitric acid, it has been obtained absolutely free from iron. From the results of these observations Delacharlonny concludes that for detecting the presence of minute quantities of iron the sulphocyanate alone should be used.—Drugg. Circ., April 1888, 82; from Jour. de Phar. et de Chim.

Ferric Salts—Hypodermic Administration.—Dr. Scipione Losi gives the results of clinical studies undertaken to determine the value of ferric salts administered hypodermically. He made use of the lactate, ferrosodic pyrophosphate, albuminate, citrate, tartrate, sulphate (precipitated with alcohol), and citro-ammoniated pyrophosphàte of iron, and all of these salts were used in solution in distilled water at ½ to 100, 1 to 100, and 1½ to 100. The author draws from his experiments the following conclusions: 1. The therapeutic action of the salts of iron introduced hypodermically is much more efficacious, and the effect is more promptly felt, than when given by the digestive tract. 2. Of the various salts of iron, the citro-ammoniated pyrophosphate is best suited to the end in view. 3. Next to this, the preference should be given to the lactate and the albuminate; they do not give rise to abscess, and the smarting is less intense and of shorter duration.—Amer. Jour. Pharm., April 1888, 181; from "Rivista Clinica," through Bull. Gén. de Thérap., Feb. 29, 1888.

NICKEL.

Nickel—Propriety of Using Cooking Utensils Plated with the Metal.—The Superior Council of Hygiene in Austria, having formally recommended that the use of nickel-plated cooking utensils should be legally prohibited, Dr. von Hamel Roos, as well as Professor Schulz, communicates three results of physiological experiments upon dogs, which seem to prove that the metal is borne in the system in large quantities without poisonous action.—Pharm. Jour. and Trans., Dec. 3, 1887, 459; from Rev. Int. Falsif.

Nickel Plating—A Good Process.—The following formula for a nickel bath for plating is recommended by "L'Echo des Mines et de la Metallurgie:" Sulphate of nickel, 1 kilo.; neutral tartrate of ammonium, 725 gm.; etherized tannic acid, 5 gm.; water, 20 kilogm. The neutral tartrate of ammonium is obtained by saturating a solution of tartaric acid with ammonia. The nickel salt must be rigidly neutralized. All is dissolved in two or three litres of water, and boiled for about a quarter of an hour, an amount of water being afterward added to make twenty litres, when the liquid is filtered or decanted. The liquor may be used indefinitely by supplying the same substances in the same proportions. Under a comparatively weak current of electricity it deposits a thick coating of nickel upon all metals in a very short time. The deposit is very white, ductile and homogeneous, and makes a smooth surface, free from scales, etc. The process will give heavy deposits upon plain or polished castings at a cost but a trifle greater than that of coppering. The same bath may be used for nickel galvanizing.—Amer. Jour. Pharm., March 1888, 141.

Nickel Salts—Innocuousness.—Prof. Riche states that the salts of nickel (which have been thought toxic), should range with the salts of iron. In experiments with dogs and guinea-pigs he has given doses varying from 120 mgm. to 1 gm. 270 mgm. without causing serious disturbances. One dog absorbed 21 gm. of the acetate of nickel in sixty days, and far from succumbing, actually increased in weight. We cannot form conclusions concerning man from these experiments, says Prof. Riche, but we may be justified in supposing that the use of nickel for culinary utensils is no more injurious for man than the use of iron would be, to which metal it bears much resemblance.—Amer. Jour. Pharm., April 1888, 181; from Rép. de Pharm., Feb. 1888.

CHROMIUM.

Chromoiodates—Formation.—According to Mr. Berg, chromoiodates are formed if solution of iodic acid is added to a solution of a bichromate, or if a solution of chromic acid is added to a solution of an iodate. The compound may be regarded as salts of

Chromoiodic Acid, formed by the union of equal molecules of chromic and iodic acids, one molecule of water being eliminated. The chromoiodates rarely form single well-formed crystals, but are obtained as crystalline crusts. They manifest a tendency to decompose with water into iodates and free chromic acid, until a certain proportion of water is present, a tendency which is overcome by adding an excess of chromic acid. They easily part with oxygen to reducing agents, and lose their water of hydration at 120°–140°. The chromoiodates of the different metals have been prepared by evaporating the solutions of the respective bichromates to which the calculated quantity of iodic acid and an excess of chromic acid have been added. The free chromoiodic acid is obtained in form of rhombic, ruby-red, deliquescent crystals, by uniting the calculated quantities of its components with a little water, evaporating over sulphuric acid, and removing mother liquor by the suction pump.—Arch. d. Phar., Nov. 1887, 1020; from Jour. de Pharm. et de Chim., xvi., 220.

Chromate of Lead—Absorption when Administered.—The experiments of Dr. John Marshall made on animals with pure chromate of lead have led to the following conclusions: 1. Absorption of lead and chromium takes place upon administration of lead chromate. 2. Owing to the insoluble nature of the salt, absorption takes place very slowly. 3. It is most likely that the absorption of lead takes place in the stomach and not in the intestinal tract. 4. The chromium of the decomposed lead chromate would be absorbed in the stomach as chromic chloride, and in the intestines as sodium chromate.—Therap. Gaz., Feb. 1888.

ZINCUM.

Zinc—Reaction with Sulphuric Acid.—It is usually supposed that the reaction between zinc and sulphuric acid in the presence of water results in the formation of sulphate of zinc and liberation of hydrogen only. Messrs. Pattison Muir and R. H. Adie, however, have made the reaction the subject of a detailed investigation, and have come to some important results. It has, indeed, been known before that sometimes other gases, such as hydrosulphuric and sulphurous acid, were formed during the reaction, but the conditions for their production were not known. The authors find that the purer the metallic zinc employed, the smaller are the quantities of secondary products produced, no matter whether a concentrated or a dilute sulphuric acid is used. When 1 molecule of this acid is diluted with 10 to 12 molecules of water, *hydrogen* is almost the sole gaseous product of the reaction, even on boiling. If the zinc used is almost chemically pure, and the reaction takes place at a temperature of 160° C., dilution of the acid diminishes both the quantity of hydro-sulphuric acid, and that of sulphurous acid. If commercial zinc is used, the proportion of the last-named acid is diminished, and with commercial zinc, even so dilute an acid as 1 mol. H_2SO_4 and 100 mol. of water, still produces some hydro-sulphuric acid at temperatures between 0° C. and the boiling point. An acid of the concentration 1 mol. H_2SO_4 and 2 mol. water generates with commercial zinc, at 100° C., scarcely traces of either hydro-sulphuric or sulphurous acids. At 165° C., however, it produces copious quantities of the former, with traces of the latter. At 180° C. hydro-sulphuric acid gas is given off in streams, almost free from sulphurous. Under the same circumstances, an almost pure zinc generates both gases in large quantities. Free sulphur is separated in notable quantities only when platinized zinc is used, the latter behaving in other respects like the commercial substance. At low temperatures, however, or with acids containing less than 2 mol. of water, free sulphur was never met with, even when hydro-sulphuric or sulphurous acid was given off. —Amer. Drugg., June 1888, 111; from Jour. Chem. Soc., 1888, 47.

Zinc and Zinc Oxide—Manufacture.—Mr. C. N. Lake contributes an interesting article on the manufacture of zinc and zinc oxide, accompanied by illustration, to Pharm. Era, Sept. 1887, 319–321.

Oxide of Zinc—Reactions with Barium Nitrate—Dr. L. C. Marquart calls attention to the fact that when the filtrate obtained by shaking oxide of zinc with water is treated with barium nitrate, as prescribed by the Ph. G. II., it sometimes occasions a precipitate, notwithstanding that it may not, and usually does not, contain a sulphate. The reaction is due to the presence of carbonate of an alkali, the precipitate being carbonate of barium.—Arch. d. Pharm., April 1, 1888, 313.

Zinc Sulphate—Commercial Quality.—Mr. G. E. Norton has examined four commercial samples of sulphate of zinc, and found them to correspond to the officinal requirement in every particular.—Pharm. Era, Sept. 1887, 322.

Zinc Sulphate—Liability to Contain Free Acid.—Mr. E. Gille draws attention to the possible presence of free acid in commercial sulphate of zinc, in sufficient quantity to render the salt unfit for ophthalmic purposes. He recommends as a convenient test of a suspected sample to dissolve 50 centigrams in 50 grams of distilled water, and to dip just below the surface of the solution a glass rod that has been moistened with ammonia solution. If the turbidity which is at once produced by the formation of zincic hydrate is permanent after agitation, the sample may be assumed to be pure; but if the liquid becomes clear again, it contains free sulphuric acid, and if this exceeds a certain limit turbidity does not occur at all.—Pharm. Jour. and Trans., June 30, 1888, 1086; from Bull. Com., May, 1888, 225.

CADMIUM.

Chloride of Cadmium—Variability of Composition.—Messrs. Weppen and Lüden when testing for pyridine bases (which see under "Organic Bases") with chloride of cadmium, obtained conflicting results by using two different samples of the latter. They found both samples of the cadmium salt to react acid, but the one contained a larger percentage of chlorine and of water than the other. Neither of the samples had the required composition, viz.: $CdCl_2+2H_2O$.—Chem. Ztg., Feb. 1, 1888, 151.

CUPRUM.

Copper—Presence and Detection in Extracts, which see under "Pharmacy."

Copper—Physiological Action.—The experience of Mr. F. Sestini leads him to the belief that the reputed high poisonous character of copper, and particularly the effect of long continued small doses of it, is exaggerated. He has, together with his family, consumed during many years food and wine which contained small quantities of copper, without experiencing any untoward effects.—Chem. Repert. (Chem. Ztg.), Jan. 22, 1888, 24; from Atti della R. Acc. dei Georgofili, 1887.

Ammonio-sulphate of Copper—Preparation of Crystals.—In order to obtain crystals of ammoniated sulphate of copper, it is usual to carefully overlay a strong solution of the compound with alcohol. To accomplish this without danger of immediate admixture of the two fluids, Mr. Roizot pours first a little castor oil on the surface of the copper solution, then carefully allows the alcohol to flow down the sides of the vessel. The alcohol presently dissolves the oil, and thus the desired contact of the fluids in distinct strata is secured.—Pharm. Era, April 1888, 133; from L'Union Pharm., Nov. 1887.

PLUMBUM.

White Lead—New Process of Preparation by the Humid Method.—Mr. Kübel converts metallic lead into litharge, which he then dissolves in a ten per cent. solution of acetate of magnesium. A current of carbonic acid is then conducted into the solution, by which the lead is thrown down as a pure carbonate in an extremely minute state of subdivision. The process is inexpensive, since the same solution is used over and over to dissolve fresh portions of litharge.—Pharm. Era, Dec. 1887, 446.

Plumbic Iodide—Preparation of an Amorphous Compound.—Mr. R. Rother finds that the plumbic iodide prepared by the formula formerly officinal contains a variable proportion of crystalline salt, and that the article of commerce exhibits a similar condition. Believing that the compound should be absolutely amorphous, he has made experiments, and recommends the following formula to obtain it in the desired amorphous condition:

Iron, in fine wire	240 grains.
Iodine	508 "
Plumbic acetate	757 "
Acetic acid,	
Water	of each sufficient.

Upon the iron wire pour three fluidounces of water, add the iodine and shake the mixture at frequent intervals until the iodine is all combined and a light-green solution has resulted. In case the iron wire is extremely fine, add the iodine in separate portions, shaking the mixture each time until the iodine color is discharged. Pass the solution through a plain filter and follow with water until the whole filtrate measures eight fluidounces. Powder the plumbic acetate, dissolve it in four fluidounces of water, and add acetic acid, drop by drop, until the solution becomes limpid. Pass the solution through a plain filter and follow with water until the filtrate measures eight fluidounces. Now pour this solution into the ferrous iodide solution, collect the yellow magma on a plain filter, wash it with water and dry the powder in the open air.—Amer. Jour. Pharm., Aug. 1887. 385–387.

Lead Manganate—A New Bleaching Agent.—It is stated in Pharm. Centralh. that lead manganate is an excellent bleaching agent for organic coloring matters in neutral, alkaline or slightly acid solution. It owes this action to the fact that it easily gives off oxygen, being reduced to a lower compound which, like the manganate, is insoluble. For this reason the bleached liquids are not contaminated with the bleaching agent. On account of its density, this compound rapidly settles, and can easily be removed by decantation or filtering. The principal advantage of this process of bleaching is that the product of the reaction can easily be regenerated. Contrary to the barium manganate, which has also been recommended as a bleaching agent, and which suffers a continual decomposition by boiling, the lead manganate does not give off a trace of lead. It is ground to a thin paste with water, and this is added in small portions to the hot or boiling liquid to be bleached, until a test of the solution shows that the desired effect has been produced. The lead manganate is specially adapted for bleaching solutions of glue, bark extracts, etc., also for oxidizing in the manufacture of certain chemical preparations, for example, potassium ferricyanide. The advantages of lead manganate as compared with hydrogen peroxide, are said to be that it is cheaper, of the same bleaching power, and more durable; that it acts in neutral, alkaline or acid solution, and can be employed without any difficulty.—Drugg. Circ., Dec. 1887, 273.

TITANIUM.

Titanic Acid—Determination.—According to Mr. Levy, the determination of titanic acid is accomplished conveniently and certainly, if the substance, which may contain an alkali or the oxides of magnesium, zinc, aluminium or copper, is melted with bisulphate of potassium, the melted mass dissolved in water, if necessary, by the aid of acid, neutralized with potassa or ammonia, after which 0.5 per cent. of concentrated sulphuric is added, and the solution is boiled for six hours, the volume being maintained by the addition of water from time to time. The titanic acid is then completely precipitated, and is collected and weighed in the usual manner. In the presence of ferric salts the process is inadmissible.—Arch. d. Pharm., Sept. 1887, 836; from Jour. Pharm. Chim., xvi. 56.

TELLURIUM.

Tellurium Chlorides—Preparation and Characters.—Mr. A. Michaelis communicates some new observations respecting the chlorides of tellurium.

Tellurium Dichloride, $TeCl_2$, is obtained by distilling the tetrachloride with the calculated quantity of tellurium. $TeCl_2$ passes over at 324° C., and is purified by distilling it once more with a little tellurium. It is a black body, not distinctly crystalline, melting at 175° C., and rapidly absorbing moisture from the air. It is decomposed by water, and more rapidly by alkalies, into telluric acid and tellurium.

Tellurium Tetrachloride, $TeCl_4$, constitutes a colorless or faintly yellow crystalline mass, melting at 214° C. and boiling at 380°C.—Arch. d. Pharm., Oct. 1887, 925; from Ber. d. D. Ch. Ges. 20, 2488.

BISMUTHUM.

Bismuth—Simple Colorimetric Test.—According to Stone, a strong solution of potassium iodide produces in very dilute solutions of bismuth sulphate which contain a little free sulphuric acid, a deep yellow color, which is distinct when one drop of the reagent is added to 10 c.c. of the solution containing $\frac{1}{100}$ mg. of the metal. The reaction may be employed for the colorimetric estimation of small quantities of bismuth.—Pharm. Era, Nov. 1887, 407; from Chem. Ztg.

Bismuth-oxyl Iodide—Preparation.—Mr. R. Rother proposes the following process for obtaining a brick-red compound corresponding to the formula BiOI:

Bismuth-oxyl nitrate	288 grains.
Potassium iodide	166 "
Calcium carbonate	200 "
Nitric acid	360 "
Acetic acid	2 fluid-ounces.
Water sufficient.	

Mix the nitric acid with two fluid-drams of water, and gradually add the bismuth oxyl-nitrate. To the crystalline mass which has resulted, add the acetic acid, and stir the mixture until perfect solution has resulted. Dissolve the potassium iodide in two fluid-ounces of water, and pour the solution into the previous one. To the black mixture add gradually the calcium carbonate. When the reaction is completed incorporate two fluid-ounces of water and decant the supernatant liquor after the red precipitate has subsided; to this residue add two fluid-ounces of water, pour the mixture into a plain filter, and after having thoroughly washed the powder, expose it in the air until perfectly dry.—Amer. Jour. Pharm., Aug. 1887, 390–391.

ARSENICUM.

Arsenic—Improved Construction of Marsh's Apparatus.—Mr. E. Lehmann proposes the following simple improvement on Marsh's apparatus, which enables the perfect regulation of the current of hydrogen: A wide mouthed, elongated pear-shaped flask is provided with a rubber cork having three perforations; two of these openings bear respectively the funnel-tube and the gas conducting-tube; the third, a glass rod, passing easily up and down, to the inner end of which a spiral of platinum is attached, having the purpose of holding a number of cylindrical pieces of pure zinc, about 3–4 cm. long; 5 or 6 of such pieces answering for a flask of ¾ litre capacity. By raising or lowering this rod into the acid liquid, the current of hydrogen may be intercepted or started at pleasure. Moreover, the contact of the zinc with the platinum appears to increase the energy of the reaction, which is at the same time very regular.—Arch. d. Phar., June 1, 1888, 512; from Pharm. Zeitschr. f. Russl., 1888, 193.

Arsenic.—Removal from *sulphuretted hydrogen*, which see.

Arsenic—Estimation by means of Iodine.—Mr. C. J. Wooley draws attention to some of the difficulties experienced in the method of Mohr for the determination of arsenic, which depends upon the conversion of arsenious acid into arsenic acid in alkaline solution. The addition of alkali is necessary, since the free hydriodic acid formed prevents the speedy conversion of the arsenious into arsenic acid; and bicarbonate of soda is usually employed for this purpose, which by boiling is converted into carbonate. The disadvantage of this consists in that a portion of the iodine is liable to combine with carbonate, and thus renders the results incorrect. Fresenius had suggested, in order to overcome this difficulty, that the arsenic be dissolved in a solution of carbonate of sodium, the excess neutralized in HCl, and the bicarbonate then added to render the solution alkaline. But this process takes some time to perform, and the author therefore sought for some salt which when dissolved in water promotes the solution of the arsenic, and which will neutralize the free hydriodic acid without setting free another acid of such strength as to hinder the reaction ; it must, moreover, be a salt which has no decolorizing effect on iodine. Such salts as Rochelle salts, neutral tartrates, phosphate of sodium, and borax were tried, the borax giving the best results, though phosphate of sodium may be used with advantage. Rochelle salt did not answer at all, on account of its failure to completely dissolve the arsenic within a reasonable space of time ; borax requiring 30 seconds (the same as bicarbonate of sodium), and phosphate of sodium 2 minutes.—Pharm. Jour. and Trans., Jan. 14, 1888, 584–585.

Arsenic—Determination in Iron Pyrites.—Mr. H. Fresenius draws attention to the fact that when the melted mass obtained by fusing finely powdered iron pyrites with 10 parts of soda and saltpetre is extracted with water, the residue still retains a little arsenic. In an example referred to, this amounted to 0.013 per cent., the solution yielding 0.129 per cent. of arsenic. The method therefore has no advantage over that of direct distillation, etc.—Chem. Repert. (Chem. Ztg.), Jan. 15, 1888, 16 ; from Ztschr. Anal. Chem., 1888, 27, 34.

Arsenic—Testing for its presence in Metallic Iron.—Mr. J. G. Bergmann points out that the presence of arsenic in powdered iron cannot be detected either by the process of the Pharm. Germ. or that of the Germ. Pharm. Committee, because *arsenide of iron* is insoluble in diluted hydrochloric acid. Hence, in examining powdered iron the arsenic will be found in the residue left undissolved by the acid. In this it may be detected either by Bettendorff's method, dissolving the residue with concentrated hydrochloric acid and the smallest possible quantity of chlorate of potassium, or by distilling with ferric chloride, ferrous sulphate, and hydrochloric acid of s. g. 1.190 (Schneider's process), in the usual manner.—Amer. Drugg., June 1888, 111 ; from Pharm. Centralhalle, 1888, No. 8.

Arseniate of Lithium—Administration in form of Effervescent Solution, which see under "Pharmacy."

Paris Green—Commercial Quality.—In reply to a query as to the alleged practice of largely adulterating the Paris green of the market, Mr. R. M. Kennedy gives the details of some chemical examinations of commercial samples, which seem to show that no such practice prevails to any extent. The finding of free arsenious acid in some samples can hardly be called an adulteration, since its presence may be due to the manner in which the article is prepared.—Proc. Penn. Pharm. Assoc., 1888, 20–22.

GERMANIUM.

Germanium—Further Observations.—Dr. Winkler gives an account of his last work on germanium. In his first announcement of its discovery he stated that the metal was obtained by reduction of the oxide in a stream of hydrogen gas, but since that time large quantities of the mineral have been found and dealt with on a much larger scale. The powdered oxide, after undergoing an elaborate process of purification, is ultimately mixed with fifteen to twenty per cent. of starch meal, made into a paste with boiling water, and rolled into balls. These balls are then placed in a crucible in contact with powdered wood charcoal, and heated to redness. On cooling, each ball is found to be converted into a regulus of metallic germanium. After removal of the adhering charcoal they are placed in a second crucible, covered with a layer of powdered borax glass, and melted in a gas furnace, when they fuse together in a single brittle regulus, fine octahedral crystals being formed at the outer surface. Among the numerous compounds of germanium prepared by the discoverer, two are of great importance, as conclusively indicating the position of the new element in the periodic system. The first is germanium chloroform, $GeHCl_3$, analogous to the similar well known compounds of carbon and silicon, which is obtained by gently heating germanium in a stream of dry hydrochloric acid gas. The chloroform passes over with the excess of hydrochloric acid, and is condensed to a liquid by a freezing mixture of ice and salt. The second is germanium ethide, $Ge(C_2H_5)_4$, analogous to the ethides of silicon and tin, which is obtained by the action of two volumes of zinc ethide upon one volume of germanium tetrachloride. The operation is performed in an apparatus filled with carbonic acid gas, and the reaction is very violent. If, however, the temperature be kept down by immersion in cold water, the action is more regular, and after two or three hours the whole solidifies. On the addition of water, gas is evolved and a layer of the oily ethide separates out. When pure, it is colorless and of weak garlic odor, slightly lighter than water, and boils at 160°.—Drugg. Circ., Dec. 1887, 275; from Jour. f. prakt. Chem., 1887.

HYDRARGYRUM.

Mercury—Filtration.—Prof. C. Bohn recommends a method for the filtration of mercury which has long been practiced in Bunsen's laboratory. A filter is made of writing paper, and numerous fine holes are pricked into it. Instead of making these round with a needle, it is better to use the point of a pen-knife, which causes the holes to be oblongly triangular. The holes should be pricked both vertically and horizontally, at right angles with each other, and part of the holes should be pricked from without and part from within. But even with this arrangement the filter sometimes become clogged, and a still better arrangement consists of the following: A tube of about the thickness of a lead-pencil and a yard long, is expanded at one end to the shape of a funnel, and at the other it is expanded to a tulip-shaped bulb, or in a wave-like form, such as is customary when rubber tubing is stretched and tied over the end of a tube. A piece of linen or chamois is firmly tied over the latter end and the tube is then suspended. On pouring mercury into the funnel, it will be pressed through the pores of the filtering medium with a pressure considerably exceeding that of the atmosphere.—Amer. Drugg., April 1888, 68; from Zeitschr. f. Instrumentenkunde.

Mercury—Distillation in Vacuo.—B. Nebel has devised an apparatus for the purpose of distilling mercury in vacuo, which is illustrated and described in Am. Drugg. (Nov. 1887, 207), from Chem. Centralbl.

Mercury—Absorption by the Skin.—Messrs. Ferrari and Asmondo, after researches made with minute precautions, have concluded that the skin does not absorb metallic mercury, although it may take up its salts. The mercury of inunctions, so they believe, becomes volatilized, and is absorbed through the respiratory organs.—Amer. Jour. Pharm., Dec. 1887, 614; from Archives de Phar., Nov. 5, 1887.

Hydrargyrum Oxydatum Flavum—Product of the Pharm. Germ. II. Formula.—Dr. Vulpius has compared the formulas of the German, Austrian, and United States Pharmacopœias, and considers that of the Pharm. Germ. II. the most rational. The color of the product is the handsomest, and it fulfills the conditions of *all* of these Pharmacopœias.—Chem. Repert. (Chem. Ztg.), Jan. 22, 1888, 24; from Ztschr. Œster. Apoth. Ver., 1888, 26, 2.

Mercuric Oxide—Delicate Reaction for the Presence of Chloride.—Mr. Th. Fels draws attention to the observation that mercuric oxide prepared from chloride by the humid method retains a portion of chloride with great pertinacity, and that the ordinary method of testing for its presence—solution in nitric acid and addition of silver nitrate—fails to reveal the last traces. The test becomes far more delicate if acetic acid is used as solvent for the mercuric oxide, 1 per cent. being readily determined, whereas in the nitric acid solution 2 per cent. are scarcely revealed.—Arch. d. Pharm., Jan. 1, 1888, 29–30.

Halogen-Mercury Salts—Preparation from the Nitrate by the action of the Halogen.—In continuation of Strohmeyer's observations upon the formation of the crystallized halogen-mercury salts, Mr. Sievers communicates a paper on the preparation of mercuric chloride, iodide and bromide and of mercurous chloride, by the action of the respective halogens upon solutions of mercuric or mercurous nitrate. The formation of the mercuric salts results according to the following equation: $Hg(NO_3)_2+2I$, (or $2Cl$, or $2Br$)$+2H_2O = HgI_2$ (or $HgCl_2$, or $HgBr_2$) $+2HIO$ (or $2HClO$, or $2HBrO$)$+2\ HNO_3$; of the mercurous chloride: $2\ Hg_2\ (NO_3)_2+Cl_2 = Hg_2Cl_2+2Hg\ (NO_3)_2$. The statement of Preuss that by the action of iodine upon solution of mercuric nitrate a basic double salt is formed, is not correct. The reaction is completely according to the above equation.—Arch. d. Pharm., May 1888, 456; from Ber. d. D. Chem. Ges., 1888, 647.

Mercuric Salts.—Action of *Chloral and Iodoform*, which see under "Organic Chemistry."

Mercury Salts—Preparation in Crystalline Condition.—Mr. H. Sievers has studied methods for preparing both mercuric and mercurous preparations in a crystalline state, not by sublimation, but in solution.

1. *Mercuric Bromide.*—This is produced by adding an excess of bromine to a solution of mercuric nitrate of the s. g. 1.197, rendered slightly acid by nitric acid. After a short time crystalline laminæ separate. It is necessary that the solution have the exact sp. gr. above mentioned. The crystals may be re-dissolved in a solution of mercuric nitrate (s. g. 1.197), when the salt will separate in form of white laminæ of a tetragonal appearance. From alcohol or water, the salt crystallizes in needles.

2. *Mercuric Chloride.*—This was prepared by passing a current of chlorine gas through a solution of mercuric nitrate (s. g. 1.197), when the salt separated in fine needles. These may be purified by recrystallization from hot water, or from alcohol.

3. *Mercurous Chloride.*—A concentrated solution of mercurous chloride was prepared by mixing 1 vol. of strong nitric acid and 4 vols. of water, and keeping this in contact with mercury for some time. Chlorine was then passed through it to saturation. This caused the separation of a crystalline and an amorphous precipitate, of which the crystalline one was removed by washing with hot water. The amorphous precipitate was then dissolved in another portion of solution of mercurous chloride by protracted boiling. On cooling it crystallized in small laminæ, which were washed, first with very dilute nitric acid, then with pure water. They were pure mercurous chloride or calomel. They had a yellowish-white color. Light gradually turns them gray, owing to the formation of mercuric chloride and metallic mercury.—Amer. Drug., June 1888, 107; from Ber. d. D. Chem. Ges., 1888, 647–648.

Calomel—Mode of Subcutaneous Injection.—Dr. Krecke has obtained favorable results in the treatment of syphilis with calomel subcutaneously injected. The calomel is for this purpose simply suspended in water containing an equal weight of chloride of sodium, ten per cent. of each being usually used. Care being taken to shake the mixture, and to hold the needle downwards until the injection has been made, one or two grains are injected into the gluteal region every five or six days.—Pharm. Jour. and Trans., July 30, 1887, 90; from Münch. Med. Wochenschr., 1887, No. 6, 93.

Calomel—Influence Upon the Decomposition of Bile.—Dr. Zawadsky, after a long and carefully made series of laboratory researches, cites the following conclusions; 1. Calomel has an antiseptic action upon the bile and the contents of the intestine. 2. This is explained by the transformation of the calomel in the bile, and in the intestine, into Hg_2O, a transformation favored by the alkaline reaction of the contents of the intestine. 3. The characteristic color of the excrements—observed after the administration of the calomel—depends: *a*, on the one hand, upon the transformation of bilirubin (perhaps of hydro-bilirubin) into biliverdin, under the influence of Hg_2O, as per the formula:

$$\underset{\text{Bilirubin}}{C_{16}H_{18}N_2O_3} + 2\,Hg_2O = \underset{\text{Biliverdin}}{C_{16}H_{18}N_2O_4} + HgO + 3\,Hg$$

with the liberation of metallic mercury; and *b*, on the other hand, upon the presence of biliverdin (a normal constituent of bile) which was prevented from decomposition on account of the antiseptic action of the calomel and of Hg_2O. 4. The acid reaction of the medium, as also the other unfavorable conditions of the juice, explain probably the absence of color in the excrements characteristic in some cases after taking calomel.—Laboratoire Pharmacolog. du Prof. Toumass, Wratsch, Nos. 15 and 16, 1887; Bull. Gén. de Thérap., July 15, 1887.—Amer. Jour. Pharm., Sept. 1887, 444.

Corrosive Sublimate—Permanent Solution.—On dissolving mercuric chloride in other than distilled water, a precipitate of oxychloride is usually produced by the earth carbonates in the water. Prof. O. Angerer states that Schilling succeeded in preventing this precipitate by the addition of sodium chloride equal in quantity to that of corrosive sublimate. Schilling prepares also *corrosive sublimate tablets* from 1 gm., or 0.5 gm. each of the two salts mentioned; these tablets dissolve rapidly, and are adapted for distilled or any other pure water.—Centralbl. f. Chir., 1887; Amer. Jour. Phar., Aug. 1887, 396.

Corrosive Sublimate—Effect of keeping on its Solutions in Water.—Mr. V. Meyer finds that solutions of corrosive sublimate in pure distilled water do not suffer any appreciable loss of $HgCl_2$ after 36 days' keeping, notwithstanding that a slight white deposit may form during that period. It is indifferent whether the container be well corked, covered with filter paper, or left open. In impure well or pond water, considerable quantities of $HgCl_2$ are separated on long standing, the quantity being largest in uncorked vessels and smallest in those well corked. Addition of an equal quantity of chloride of sodium appeared to increase the permanence of the uncorked and lightly covered solutions to some extent, but had no further influence on the solution in the securely corked vessel.—Arch. d. Pharm., Oct. 1, 1887, 881; from Pharm. Centralh.

Corrosive Sublimate—Value of Acid Solutions as Disinfectants.—Mr. Laplace has made a study of the effects of acid solutions of corrosive sublimate as disinfectants, and concludes as follows from his work, which was done in Koch's laboratories, at Berlin: Sublimate, with tartaric acid in solution, can be recommended as a surgical disinfectant dressing for the following reasons:

By combining the action of tartaric acid, we obtain the full action of sublimate in fluids and surfaces containing albuminoids. Infected wounds should be irrigated from ten to twenty minutes daily; a single thorough cleansing is enough for fresh wounds, after which a dressing of tartaric acid-sublimate gauze is applied.

Tartaric-sublimate gauze does not interfere, in any degree, with iodoform and the other substances commonly used in surgery. It gives in the laboratory and in practice better results than sublimate alone. It does not irritate wounded tissues. Sublimate dissolves better in solution of tartaric acid than in water alone. The compound solution does not decompose in the tissues or dressings, and is cheap.

Solutions may be made after the following formulæ:

Corrosive sublimate	1 part.
Tartaric acid	5 parts.
Water	1000 "

for irrigation.

For the preparation of dressings:

Corrosive sublimate	5 parts.
Tartaric acid	20 "
Distilled water	1000 "

may be used, in which dressing material should soak two hours, after which it may be wrung out and dried.

Laplace's investigations consisted of experiments in Koch's laboratory, and in von Bergmann's and Fehleisen's clinics. He had previously demonstrated that the efficiency of sublimate and carbolic solutions as germicides is greatly increased by the addition of hydrochloric acid.—Deutsche Med. Wochenschrift, Oct. 6, 1887.

Corrosive Sublimate — Danger of External Application. — Professor Virchow calls attention to several cases of corrosive poisoning. Patients who had used for disinfecting purposes external applications of corrosive sublimate suffered serious derangement of the intestines, from which they died. The real cause of death was ascertained only after making chemical examinations of the affected organs, which revealed the presence of mercury, and this could only be traced to the corrosive sublimate which had been used externally. Since the foregoing, Professor Virchow observed three more cases of fatal poisoning from corrosive sublimate.—Ap. Ztg., 1888, 13.

Mercurammonium Chlorides—Preparation, etc.—In pharmaceutical and chemical text-books mention is made of three compounds derivable from the formula of ammonium chloride, by the introduction of dyad mercury in place of hydrogen. These are: (1) mercurammonium chloride (NH_2HgCl)—the officinal ammoniated mercury, or commonly known as "infusible white precipitate;" (2) mercurdiammonium chloride $(NH_3Cl)_2Hg$, or "fusible white precipitate;" and (3) dimercurammonium chloride hydrated, $NHg_2Cl.H_2O$. With a view of studying more especially the first two compounds as to the best methods of commercial preparation, the action of heat upon them as applied to the precipitation from cold and boiling solutions, if possible to devise a test by which they could be easily distinguished, and lastly, a ready method of analysis, a series of experiments were made by Mr. Frank X. Moerk, a detailed description of which is given. The author sums up his results as follows: Mercurammonium chloride is produced by the addition of ammonium hydrate in excess to a solution of mercuric chloride, as well as by the U. S. P. process. If the ammonium hydrate be added to a boiling solution of mercuric chloride, the above compound will separate as a granular quickly subsiding powder, easier washed than the U. S. P. product. Mercurdiammonium chloride is not gotten pure by the method asserted to yield it—that is, by the precipitation of the solution containing the chlorides of mercury and ammonium with sodium carbonate. What is gotten is either a mixture of mercurammonium with mercurdiammonium chloride or else a double salt of mercurammonium chloride and ammonium chloride, of varying composition. The product nearest approaching in composition that of mercurdiammonium chloride was gotten by using a boiling solution of the chlorides, and adding the sodium carbonate, allowing to stand until effervescence ceased, and filtering and washing.

Supposing these products to be a mixture of NH_2HgCl and $(NH_3Cl)_2Hg$, the percentage of the former can be gotten by subtracting from the percentage of mercuric sulphide yielded by the sample, 76.09, and dividing the remainder by 0.1618.

Tests to show presence of mercurdiammonium chloride or ammonium chloride in mercurammonium chloride are, firstly, fusibility, which will detect larger quantities, and secondly, the decomposition product by boiling the specimen with large quantities of water, one part precipitate to one hundred parts, repeated twice. If the specimen be pure, only the faintest shade of yellow should tinge the precipitate.

An analysis, which undoubtedly is the best method of determining either of the above compounds, is best carried out as given in the analysis of samples. The amount of mercuric sulphide obtained should equal 92.27 per cent. of the sample taken, a smaller percentage proving admixture.—Amer. Jour. Pharm., Feb. 1888, 80–87.

Hydrargyrum Ammoniatum—Examination of Commercial Specimens.—Mr. Wm. J. Williams prepared ammoniated mercury by the pharmacopœia process. This specimen, which corresponded with all the requirements of the Pharmacopœia, was marked No. 1. Three commercial specimens were purchased, of which No. 2 alone was fusible. The pharmacopœial tests being applied to all, the following results were obtained:

PHARMACOPŒIAL TESTS.	No. 1.	No. 2.	No. 3.	No. 4.
Heated to redness,	Completely volatile.	2 per cent. residue, mostly Fe_2O_3.	2½ per cent. residue, mostly Fe_2O_3.	Completely volatile.
Solubility in HCl,	Soluble; no effervescence.	Soluble; no effervescence.	Soluble; no effervescence.	Soluble; slight effervescence.
Lead (solution in acetic acid tested with H_2SO_4,)	Absent.	Absent.	Absent.	Absent.

—Amer. Jour. Pharm., June 1888, 279.

Biniodide of Mercury—Use for the Preparation of an Antiseptic Soap. See *Sapones*, under "Pharmacy."

Mercuric Iodide—Preparation in an Amorphous Condition.—Mr. R. Rother gives reasons why the officinal mercuric iodide should be an amorphous rather than a crystalline compound, and recommends the following formula whereby an amorphous preparation is secured:

Iron in fine wire	240 grains.
Iodine	508 "
Mercuric chloride	541 "
Sodium chloride	240 "
Water, sufficient.	

Pour three fluidounces of water on the iron wire, add the iodine at intervals, if necessary, shake the mixture occasionally, until the brown color is discharged, and pass the light green solution of ferrous iodide through a plain filter. Then follow with water until the whole filtrate measures eight fluidounces. Powder the mercuric chloride, add the sodium chloride, and pour on four fluidounces of water, stir the mixture until the salts are dissolved, and pass the solution through a plain filter, adding water until the whole filtrate measures eight fluidounces. Now gradually pour the iron solution into this, stirring the mixture meanwhile. Let the precipitate subside, and decant the supernatant liquor. Wash the residuary precipitate three or four times in succession, each time with six to eight fluidounces of water, then pour it into a plain filter, and expose the drained precipitate in the open air to dry.

Mercurous Iodide, also, is difficult to obtain in a desirable condition. He recommends the following as a suitable formula:

Mercuric chloride	60 grains.
Mercurous nitrate	262 "
Potassium iodide	166 "
Sodium chloride	500 "
Nitric acid diluted,	
Water	of each sufficient.

Mix the mercuric chloride, sodium chloride and potassium iodide and stir the mixture with sufficient water, gradually added, until the salts are all dissolved. Pass this solution through a plain filter, and follow with water until the whole filtrate measures six fluid-ounces. Powder the mercurous nitrate, add four fluid-ounces of water and sufficient diluted nitric acid, drop by drop, until, with constant stirring, a clear solution is obtained. Warm the first solution and gradually add the second whilst stirring the mixture, or mix the two solutions first and then heat the mixture. When, after sufficient warming, the bright yellow precipitate has firmly subsided, decant the supernatant liquor. Mix the residuary mercurous iodide with four to six fluid-ounces of water, pour the mixture into a plain filter, and thoroughly wash the precipitate with sufficient water. Finally dry the powder by exposure, but shielded from strong daylight.—Amer. Jour. Pharm., Aug. 1887, 387–390.

Mercury Cyanide—Value as a Remedy in Diphtheria.—See *Cyanide of Mercury* under "Cyanogen Compounds."

Mercury Carbolate—Preparation and Characters.—See *Carbolate of Mercury*, under "Organic Chemistry."

Mercury Salicylate—Preparation and Characters.—See *Salicylate of Mercury*, under "Organic Chemistry."

ARGENTUM.

Silver—Lowest Compound with Oxygen.—Mr. C. Friedheim having questioned the existence of the compound Ag_4O, previously described by O. v. d. Pfordten, on the ground that finely divided silver is oxidized by permanganate of potassium, and that the supposed oxide is simply metallic silver, Mr. O. v. d. Pfordten has studied the action of permanganate upon metallic silver, and finds that in the absence of oxygen acidulated solutions of permanganate have no effect whatever upon pure metallic silver. In the presence of oxygen slow and gradual solution results. The author maintains that an oxide of the above composition does exist, and expects soon to communicate further confirmatory results. —Arch. d. Pharm., March 1888, 270; from Ber. d. D. Chem. Ges., 20, 3375.

Nitrate of Silver—Reduction by Metals in the Humid Way.—Mr. Senderens finds that to effect the complete precipitation of silver from its solution as nitrate, 2 equivalents of lead are necessary for 1 equivalent of silver. This is due to the fact that a bibasic nitrosonitrate of lead is formed, which is partially dissolved, with formation of a yellow solution, and partial deposition with the reduced silver. But this basic lead nitrite undergoes further decomposition, with formation of a tribasic nitrite of lead, and the reaction does not end until 3 equivalents of lead have been consumed for 1 equivalent of silver. Zinc, iron, cadmium, tin, antimony and aluminium, react similarly to lead, the re-precipitation of the metallic silver being accompanied by a reduction of the nitric acid originally combined with it.—Arch. d. Pharm., Aug. 1887, 741; from Jour. Pharm. Chim. 1887, 433.

AURUM.

Gold—Rapid Solution by a Mixture of Hydrochloric Acid and Nitrosulphuric Acid, which see under "Nitrogen."

Gold Sulphides—Preparation and Characters.—In his recent paper on gold oxide (see Proceedings, 1887, 239), Mr. G. Krüss had shown that the oxide Au_2O is obtainable in a pure condition, and that it is completely soluble in water. The author has now, together with Mr. L. Hoffmann, shown that the sulphide Au_2S is also readily soluble in water. It was prepared as follows: A solution of chloride of gold is treated with cyanide of potassium until completely decolorized, the solution of potassium aurocyanide is concentrated upon a water bath and treated with diluted hydrochloric acid. The yellow cyanide of gold thus separated is, after careful washing with water, dissolved in solution of potassium cyanide, the solution is supersaturated with sulphuretted hydrogen, and then treated with hydrochloric acid in excess. The liquid is now heated to boiling, the heavy precipitate collected on a filter, washed with water, acidulated with hydrochloric acid, then with alcohol, ether, bisulphide of carbon, and finally again with ether. The aurosulphide (Au_2S) so obtained is brown-black when dry, and, in its freshly precipitated condition, is very readily soluble in water, forming a brown fluid, which appears perfectly clear when viewed by transmitted light. When completely dried over phosphoric anhydride, it is no longer soluble in water. By bromine water the aurosulphide is gradually dissolved with formation of $AuBr_3$ and H_2SO_4.—Arch. d. Pharm., Oct. 1887, 925; from Ber. der D. Chem. Ges., 20, 2369.

PLATINUM.

Platinum Sponge—Use as a Vaporizing Agent in the Treatment of Disease.—Mr. Onesimus has introduced a vaporizing apparatus having for its principal constituent platinum sponge, and depending for its action upon contact with alcohol, ether or essential oils, which keep it in a state of incandescence, after the manner of a platinum sponge glow lamp, the products of oxidation together with some ozone formed constituting the medicinal agent. It is said that by using the apparatus in a room with different agents to be converted into vapor, very distinct results are obtained in a short time, the most definite effects being obtained in cases of coryza, bronchitis with catarrh, irritation of the mucous membrane of the nose, and hay fever.—Pharm. Jour. and Trans., Dec. 3, 1887, 459; from Phar. Centralh. No. 17, 1887, 174.

PALLADIUM.

Chloride of Palladium—Application for the Detection of Gas Leakage.—Paper saturated with a solution of chloride of palladium has been recommended for gas leakages. The paper must be used wet, the gas revealing itself by coloring the paper brown or black.—Amer. Drugg., Nov. 1887, 216.

ORGANIC CHEMISTRY.

GENERAL SUBJECTS.

Synthetical Medicinal Compounds—Doses, Uses, etc.—Mr. H. Helbig communicates an account of the different synthetical compounds that have in recent years been introduced into medicine, confining himself mainly to the pharmaceutical points respecting them. A brief resumé of the doses and uses of these remedies may properly find place here; whilst for the particulars respecting their chemical characteristics, etc., reference must be had to the original paper.

Acetphenetidin, Paracetphenetidin (NH ($COCH_3$) C_6H_4,OC_2H_5).—Described as an excellent antipyretic in doses of 3 to 8 grains. Apparently devoid of secondary effects.

Amylene Hydrate, Tertiary Amylic Alcohol, Dimethyl-ethylcarbinol ($CH_3CH_3C.OH.C_2H_5$).—Recommended as a soporific. Dose, 1 drachm. No unpleasant secondary effects recorded. Desirable form for administration:

Amylene hydrate,		
Liq. glycyrrhizæ	āā	ʒj.
Aquæ ad		℥j.

Also in gelatin capsules.

Antifebrin, Acetanilide, Phenylacetamide ($C_6H_5NH.CH_3CO$).—A valuable antipyretic, given in doses of 2 to 10 grains. Desirable form for administration:

Antifebrin		ʒj.
Brandy		℥ivss.
Distilled water,		
Syrup	āā	ʒvj.

Antipyrin, Oxydimethylchinizine ($C_{10}H_9CH_3.N_2O$).—The most popular of modern antipyretics, given in doses of 15 to 30 grains. Desirable form for administration:

Antipyrin	80 grains.
Simple syrup	℥j.
Water, to make	℥iv.

Antithermin, Phenylhydrazinlevulinic Acid.—($CH_3C(C_6H_5N—NH)$-$CH_2—CH_2COOH$).—Recommended as a febrifuge. Details are wanted as to dose and effect.

Aseptol, Acidum Sozolicum, Orthophenolsulphonic Acid ($C_6H_4OHSO_2$-OH).—Antiseptic. A 33⅓ per cent. solution of orthophenolsulphonic acid is understood under the name "aseptol." Free from poisonous or irritating properties. Applied in 3, 5 or 10 per cent. solutions.

Betol, Salicylate of β Naphthol Ether ($C_6H_4OH.COO.C_{10}H_7$).—Analogous to "salol." Recommended as a remedy in rheumatism, cystitis, etc., in doses of 5 to 8 grains.

Hypnon, Acetophenon ($C_6H_5COCH_3$).—A powerful soporific in doses of 3 to 8 grains. In consequence of its almost caustic action on the mucous membrane of the mouth, it is best dispensed in capsules of gelatine containing 1 grain of the remedy combined with 10 grains of almond oil.

Methylal, Dimethyl Ether of Methylene, ($CH_2(OCH_3)_2$). Soporific in doses of 20 to 25 grains. Desirable form for administration:

Methylal	ʒ i.
Syrup of orange flowers	℥ ss.
Water	℥ j.

Locally in media containing 15 per cent.

Naphthalin ($C_{10}H_8$).—*A Valuable Antiseptic.*—Internally in chronic anteric catarrh, typhoid fever, etc. Dose 2 to 8 grains. Desirable form for administration:

Naphthalin,		
Sugar	āā	30 grs.
Oil of bergamot		1 gr.

Divide into 10 powders, which are preferably given in wafers.

Naphthol, β Naphthol, Isonaphthol, ($C_{10}H_7OH$). Used as a substitute for tar preparations, externally in two to five per cent. solutions. Its toxic action precludes its use internally. In ointment it may be used up to a strength of 25 per cent.

Salol, Phenylether of Salicylic Acid ($C_6H_4OH.COO.C_6H_5$.)—Febrifuge and anti-rheumatic, in dose of fifteen to thirty grains.

Thallin ($C_9H_{10}N(OCH_3)$.)—Powerful antipyretic, given in form of sulphate or tartrate in doses of about eight grains. Externally as injection in acute and chronic gonorrhœa in solution one drachm to six ounces.

Urethan.—Ethyl of Urethan ($CO(NH_2)\ OC_2H_5$).—A mild hypnotic in doses of 15 to 40 grains, given desirably in the following combinations:

Urethan	ʒ ij.
Simple syrup	℥ ij.
Water	℥ iij.

—Amer. Jour. Pharm., Nov. 1887, 563–569. Yearbook of Pharm., 1887.

HYDROCARBONS.

(Including Volatile Oils.)

Benzol—Formula for its Administration.—Dr. Macalister gives the following formula for administering benzol as a remedy for whooping-cough:

Pure benzol		♏ij.
Alcohol,		
Compound tincture of chloroform	āā	♏ijss.
Simple syrup		♏xx.
Mucilage, ad		ʒj.

From 1 to 3 drachms may be given, according to age. The comp. tinct. of chloroform is that of the Br. Pharm. (viz., chloroform, 1 fluidounce; alcohol, 4 fluidounces; comp. tinct. cardamom, 5 fluidounces).—Amer. Drugg., April 1888, 76.

Canadol—A New Hydrocarbon from American Naphtha.—Dr. Pliouchkine, under the name of "Canadol," describes a hydrocarbon from American naphtha, transparent, very volatile, having an odor of benzin, and as being insoluble in water and alcohol. Using it as a local anæsthetic he obtained the desired effect in one minute; unlike the effect obtained from ether, the sense of coldness lasted for several minutes. He was thus able to use it in enucleations and minor surgical operations.—Amer. Jour. Pharm., Oct. 1887, 490; from Bull. Méd., Aug. 21, 1887.

Beta-Naphthol—Cheap Production.—Mr. Fischer states that beta-naphthol, for medicinal use, is sold at unreasonably high prices. A product, equally as pure and decidedly cheaper, can be obtained by recrystallizing ordinary naphthol of commerce from petroleum benzin.—Rundschau, Prag., 1887, 998; from Pharm. Ztg.

β-Naphthol—Solubility and Reactions.—Mr. Desesquelle finds that the solubility of β-naphthol in water is not near as great as given by current writers (1:550 or 1:1000). He finds it to require about 5000 parts of distilled water at 18° for solution, and that it dissolves very slowly and only after prolonged agitation. A litre of water, therefore, takes up only about 20 cgm. of naphthol. To the reactions given by the German chemists, the following should be added: Potash, soda, and certain alkaline salts, give the aqueous solution of β-naphthol the same violet fluorescence as ammonia; this disappears on the addition of an acid. 2. Chloride of lime in solution gives a yellowish tint; but the solution must be added drop by drop. 3. A mixture of concentrated sulphuric and nitric acids determines a beautiful rose color, lasting for a few seconds; it then passes to a "red currant" color, which deepens to a purplish-red, and changes with alkalies to a yellowish color. 4. Nitric acid, charged with nitrous vapors, gives a rose color, which gradually passes to yellow. 5. Hypobromite of soda gives, like chloride of lime, a yellow color, which an excess of the reagent causes to disappear. 6. Bromine water and chlorine water give a white precipitate. β-napthol often has a rose tint, which it holds pronouncedly in its alcoholic solution. It is slightly soluble in glycerin and liquid paraffin.—Amer. Jour Pharm., Dec. 1887, 613; from Archives de Pharm., Nov. 5, 1887.

Hydronaphthol—Use as an Antiferment.—Mr. Justus Wolff draws attention to the value of hydronaphthol as an antiferment for various pharmaceutical preparations. Hydronaphthol is, so far as is known, the only phenol derivative that is non-poisonous and at the same time possesses the most powerful antiseptic action. It may therefore be used with impunity for the preservation of foods, beverages, pharmaceutical extracts, syrups, and solutions of organic substances, etc., that are liable to fermentive decomposition. Thus it intercepts in sugar solutions the fermentation already well advanced when added in proportion of 1 : 3000, while in proportion of 1 : 20,000, or even 1 : 30,000, it retards fermentation from two to six weeks. At temperatures exceeding 15° C., however, a larger proportion, according to increase of temperature, will be found necessary. It is important that the hydronaphthol shall be completely dissolved in such liquids. Examples are given of its utility as follows: *Simple syrup* may be preserved completely during the hottest summer weather by rubbing 16 grains of hydronaphthol to a thin magma, or dissolving it in 2 drachms of alcohol, and adding this to 1 quart of the syrup heated to 60° to 75° C., then stirring or agitating until dissolved. A gallon of such solutions as gelatin, gum arabic, dextrin, albumen, etc., may be preserved in the same manner with from 30 to 32 grains of hydronaphthol. Thin extracts are preserved like syrups, while thick extracts require only one part to 3000 or 5000.—D. A. Apoth. Ztg., July 1, 1888, 100–101.

Hydronaphthol—Antiseptic Value.—Mr. Thomas F. Knock reports a series of experiments undertaken to determine the utility of hydronaphthol as a preservative for different pharmaceutical preparations, such as solutions, infusions, mucilages, syrups, etc., etc. His results on the whole were not very favorable, though he does not deny that, with more extended observation, its range of usefulness may be found much greater than is indicated by his experiments. Certain infusions kept remarkably well in its presence; while mucilage of acacia, syrup of acacia, solution of tartrate of iron and potassium were not influenced by its presence in any degree.—Proc. Virg. Pharm. Assoc., 1888, 57–59.

Naphthalin—Effect on the Eye.—Mr. E. Magnus confirms the observations of Dr. Panas and others with regard to the effects produced upon rabbits by naphthalin. In all cases inflammation of the kidneys was produced when naphthalin was given for a length of time in daily quantities of 8 to 23 grains. But the most remarkable effects are those produced on the eyes. There appear first in the retina glistening specks, which are especially numerous at the point where the optic nerve enters. The vitreous becomes filled also, in some cases, with what appear to be crystalline scales, like crystals of cholestrine. After a time the lens is invaded, a delicate net-work first forming on its posterior surface, but rapidly spreading until the entire lens becomes opaque. The nature of the deposit has not been ascertained, but it is believed to indicate an inflammatory action in the eye.—Pharm. Era, April 1888, 134.

Naphthalin—Value in the Treatment of Chronic Diarrhœa, Cholera, etc.—Rossbach has used naphthalin successfully in chronic diarrhœa. Bouchard considers it valuable for obtaining antisepsis in cholera and typhoid fever. It is serviceable in vesical affections when the urine is to be disinfected. In the form of pomade it is used for eczema and psoriasis. It serves also to replace ac. carbol. in surgical dressings, either as a pomade or as a liquid, containing 30 gm. to 1 kilo of alcohol. For internal use, Bouchard recommends this formula: Naphthalin 5 gm.; sugar pulv. 5 gm.; oil of bergamot 2 drops; to make 20 parts, one to be taken every hour. Mâreau recommends that it be taken in gluten capsules containing 0.25 gm. each; they dissolve only in the intestine.—Amer. Jour. Pharm., Aug. 1887, 401–402; from Jour. de Pharm. d'Als.-Lor. 1887.

Paraffin—Separation from Liquid Hydrocarbons.—Mr. R. Zaloziecki has determined that one part of paraffin requires for solution at 16°–18° C., 450,000 parts of 75 per cent. ethylic alcohol and only 350 parts of amylic alcohol, that 1.060 parts of the latter are required at 2°–4° C. One part of paraffin is also soluble in 12,000 parts of a mixture of equal volumes of ethylic alcohol of 75 per cent. and amylic alcohol at a temperature of 16°–18° C., while at 2°–4° C., 42,500 parts of the same mixture are required. On these differences in solubility the author bases a method for the separation of paraffin from liquid hydrocarbons, which is particularly interesting by reason of its usefulness for the examination of the various kinds of petrolatum. For the purpose of assay, a sample of the substance weighing between 10 and 20 grams, or measured by c.c., is placed into a beaker, mixed with five times its weight of amylic alcohol, and afterwards the same amount of alcohol (of 75 per cent.) is added. The mixture is allowed to stand, well covered, during several hours (the longer, the better) in a cold place, if possible below 4° C. (40 F.), then passed through a dry and cold filter, and the residue on the filter washed with a cold mixture of 2 parts of amylic alcohol and 1 part of alcohol of 75 per cent. The exact determination of the weight of the precipitated paraffin is best accomplished by extracting the residue on the filter with ether or benzin in a continuous extraction apparatus, the contents of the receiving flask being finally heated at 125° C. (257° F.), for two hours, to deprive them of the volatile menstruum, and completely dry the residue before weighing. Specific directions are given to this end. When examining crude oils, or other crude petroleum products, the author recommends the increase of the solvent to about ten times the quantity of substance to be examined, and to let the mixture stand at least twelve hours in the cold. The method may also be used to determine the quantity of paraffin in admixture with saponifiable fats, resins, resin oils, etc., wax being however excluded, being likewise precipitated by the alcohol mixture. — Amer. Drugg., April 1888, 70–71; from Dingl. Polyt. Jour. 297, 276.

Paraffin Oil—Occurrence of Alkaloidal Bases.—Mr. A. Weller has obtained alkaloidal bodies from Saxon paraffin oils, the so-called yellow paraffin oils of s. g. 0.850–0.860, which are employed in the manufacture of quinine. These bases constitute a volatile colorless oily substance, s. g. 0.98–0.99, and having an intense, unpleasant odor, which, when they were heated, resembled that of pyridine. They gave the usual alkaloid reaction, contain nitrogen, but neither oxygen nor sulphur. They unite with acids, with evolution of strong heat to form salts; the oxalate being a handsomely crystallized salt having the glistening appearance of mother of pearl.—Arch. d. Pharm., Sept. 1887, 824; from Ber. d. D. Chem. Ges., 1887, 2097.

Paraffin Oil—Use as a Vehicle in Hypodermic Injections.—In addition to the observations respecting the use of paraffin oil in hypodermic injections recorded in Proceedings 1887 (p. 242), the following abstracts from different French journals may find place here. Dr. Dujardin-Beaumetz states that the oil is innocuous, and can be used with advantage subcutaneously as a vehicle for various irritating compounds, the acrid nature of which is thus very materially modified. It dissolves fixed and volatile oils, camphor, benzol, carbon bisulphide, iodoform, iodine, bromine and phosphorus. To be adapted for such use, paraffin oil should not have been treated with sulphuric acid, but should be neutral to test paper, inodorous and tasteless, and should not give off vapors below 180° C. Mr. Adrian has observed a distinct acid reaction on the treatment with hot alcohol of Russian and American paraffin oils, as well as that prepared from soft paraffin with ether at —10° C. (14° F). The specific gravities of these oils varied from 845 to 880. To be adapted for medicinal purpose such oils should be colorless, not fluorescent, inodorous, insipid, and of the density 875 to 890; when heated to 50° C. they should not give off the odor of petroleum, and nothing should distil over below 360° C. (680° F.); at —15° C (5° F.) they should neither congeal nor become turbid; they should not impart an acid reaction to hot alcohol, and when treated with sulphuric acid in a water-bath for 24 hours, should at most produce a light-brown color.

Dr. J. Ley draws attention to the experiments of Dr. Balzer, who finds that digitalin, aconitine, quinine and other alkaloids may be administered in combination with paraffin oil, but require to be dissolved in chloroform or ether before mixing with this oil. For various reasons Dr. Ley prefers a vegetable oil as a vehicle for hypodermic injections, and finds that

Purified groundnut oil answers the purpose well. The purification is effected by bleaching in the sunlight, decolorizing with animal charcoal, and sterilizing; it is then an excellent vehicle for volatile oils, iodoform and phenol, and of the latter rather concentrated solutions,—containing from 3 to 10 per cent. of phenol—may be used. The phenol solutions are made with the aid of a moderate heat.—Amer. Jour. Pharm., Aug. 1887, 398–399.

Petrolatum—Examination of Commercial Specimens.—Mr. John G. Patton examined a number of samples of petrolatum, as to color, melting point, solubility in 64 parts of boiling alcohol, treatment for two hours with sulphuric acid, specific gravity 1.54, and heating upon platinum foil. Each sample was also digested for half an hour with an equal weight of soda and five parts of water, the aqueous liquid being then supersaturated with dilute H_2SO_4, to determine the presence of oily or resinous matters.

The results tabulated are as follows:

Sample from	Color.	Begins to melt.	Melts at	Alcohol treatment.	Effect of H_2SO_4.	Vapors from platinum foil.	Treatment with soda.
New York	yellow amber	28° C.	36° C.	insoluble	considerably darkn'd	not acrid	no oil
Philadelphia.	orange yellow	37° C.	45° C.	insoluble	slightly darker	not acrid	no oil
Binghamton.	orange red	39° C.	48° C.	insoluble	much darker	acrid	trace of oil
Philadelphia.	orange yellow	39° C.	47° C.	insoluble	slightly darker	not acrid	no oil
Cleveland	yellowish	32° C.	39° C.	insoluble	very slightly darker	not acrid	no oil
New York	dark orange	31° C.	40° C.	insoluble	much darker	acrid	trace of oil

—Amer. Jour. Pharm., Jan. 1888, 11.

Petrolatum.—Addition to camphor for the purpose of maintaining its pulverulent condition. See *Powdered Camphor*, under "Pharmacy."

Volatile Oils—Difference in Solvent Action upon Iodol.—Mr. E. Hirschsohn, having observed that oils of turpentine of different origin possessed a very varying solvent power for iodol, has extended his experiments to other volatile oils and determined the solubility of iodol to be as follows:

One gram of iodol requires for solution the following quantities of essential oils:

Almond	1.4–2 c.c.	Lemon, com.	30–40 c.c.
Anise	16. –17 "	Neroli	9–11.5 "
Anise, star	19. "	Orange, bitter	50. "
Bay	20. "	" sweet	30. "
Bergamotte, pure	18.5 "	" curaçoa	9.5–10 "
Caraway	2.3–3 "	Petit grains	13. –15 "
Cassia	2. "	Peppermint (all sorts)	4. –5 "
Cinnamon	2. "	Sassafras, pure	20. "
Cloves	12. "	Safrol, pure	29. "
Copaiba	80. "	Turpentine (French lævogyre)	500. "
Cubeb	7. "	Turpentine, rectified	60. "
Fennel	4.4 "	Wintergreen	9. –11 "
Lemon, pure	48. "		

The author's experiments having been made with commercial iodol, a body of undetermined purity, he gives his results with reservation, but considers them of sufficient interest to warrant further experiments with pure iodol, thinking that possibly the remarkable distinction in their solvent action on iodol may lead to a method for establishing their identity and purity.—Amer. Drugg., Dec. 1887, 227; from Pharm. Zeitschr. f. Russl., 1887, No. 33.

Volatile Oils—Preservation by Alcohol.—Mr. A. W. Jacob, in reply to a query on the subject, advises the addition of a little alcohol—about one ounce to the pound—to such oils as orange and lemon, and to keep them in a cool place.—Proc. Virg. Pharm. Assoc., 1888, 60.

Essential Oils—Yield from Various Plants, etc—The following table, as compiled from Messrs. Schimmel & Co.'s report on essential oils by the editor of "American Druggist," is reproduced here as showing the percentages of essential oil obtainable under the most favorable conditions. The figures representing the average yield on a manufacturing scale will be generally found much larger than those previously reported by other authorities who work only on a small manufacturing scale:

Natural Product.	Average yield per cent.	Natural Product.	Average yield per cent.
Ajowan seed	3.000	Arnica flowers	0.040
Almond, bitter	0.4–0.7	" root	1.100
Angelica root, Thuringia	0.750	Asafœtida	3.250
" " Saxony	1.000	Avens root	0.040
" seed	1.150	Balsam Copaiba, Para	45.000
Anise seed, Chili	2.400	" Gurjun	65.000
" Levant	1.300	" Peru	0.400
" Moravia	2.600	Basil, sweet (herb)	0.040
" Russia	2.800	Bay leaves	2.3–2.6
" Spain	3.000	Buchu leaves	2.600
" Thuringia	2.400	Butter Bur root	0.056

Natural Product.	Average yield per cent.	Natural Product.	Average yield per cent.
Calamus root	2.800	Heracleum seed	1.000
Canella bark	1.000	Hops	0.700
Caraway seed, cultivated.		Hyssop	0.400
" Germany	4.000	Iva herb	0.400
" Holland	5.500	Juniper berries, Germany	0.5–0.7
" Moravia	5.000	" " Hungary	1.0–1.1
" East Prussia.	5.000	" " Italy	1.1–1.2
Caraway seed, wild.		Laurel berries	1.000
" Germany	6.0–7.0	" leaves	2.400
" Norway.	6.0–6.5	" California	7.600
" Russia	3.000	Lavender flowers, Germany	2.900
Cardamom seed, Ceylon	4.0–6.0	Linalve wood	5.000
" Madras	5.000	Lovage root	0.600
" Malabar.	4.250	Lupulin	2.250
" Siam	4.300	Mace	11.0–16.0
Carrot seed	1.650	Marjoram, fresh	0.350
Cascarilla bark	1.750	" dry	0.900
Cassia buds	1.350	Masterwort	0.800
Cedar wood	3.500	Matico leaves	2.400
Celery herb	0.200	Melissa herb	0.100
" seed	3.000	Michelia bark	0.300
Chamomile, German	0.285	Milfoil	0.080
" Roman.	0.7–1.0	Mugwort herb	0.040
Chekan leaves	1.000	" root	0.100
Cinnamon, Cassia	1.500	Musk seeds	0.200
" Ceylon	0.9–1.25	Mustard, East Indies	0 590
Cloves, Amboina	19.000	" Germany	0.750
" Bourbon	28.000	" Holland.	0.850
" Zanzibar	17.000	" Italy (Puglia)	0.750
Clove stems	6.000	" Russian	0.500
Coriander, East Indies.	0.150	Myrrh.	2.5–6.5
" Holland	0.600	Nigella seed	0.300
" Italy	0.700	Nutmeg.	8 0–10.0
" Mogadore	0.600	Nard, Celtic, root	1.000
" Russia.	0.900	Olibanum	6.300
" Thuringia	0.800	Opoponax	6.500
Crisp mint	1.000	Origanum (Creta).	3.500
Cubebs	12.0–16.0	Orris root	0.200
Culilaban bark	3.400	Parsley herb	0.300
Cumin seed, East Indies	2.250	" seed	3.000
" " Malta	3.900	Parsnip seed	2.400
" " Mogadore	3.000	Patchouly herb	1.5–4.0
" " Syria	4.200	Peach kernels	0.8–1.0
Dill seed, Germany	3.800	Pepper, black	2.200
" Russia	4.000	Peppermint, fresh	0.300
" East Indies	2.000	" dry.	1.0–1.25
Elder flowers	0.025	Pimenta.	3.500
Elecampane root	0.600	Pimpinella root	0.025
Elemi resin	17.000	Poplar buds	0.500
Eucalyptus leaves.	3.000	Pyrethrum herb	0.030
Fennel seed, Galicia	6.000	Rose, fresh.	0.050
" " Saxony	5.0–5.6	Rosemary, wild	0.350
" " East Indies	2.200	Rosewood	0.040
Galbanum	6.500	Sage, Germany.	1.400
Galangal	0.750	" Italy	1.700
Ginger root, Africa	2.600	Sandal, East Indies	4.500
" " Bengal	2.000	" Macassar	2.500
" " Cochin China	1.900	" West Indies	2.700
" " Japan	1.800	Sassafras	2.600

Natural Product.	Average yield per cent.	Natural Product.	Average yield per cent.
Savin	3.750	Turmeric root	5.200
Snake root, Canada	2.8–3.25	Uva ursi leaves	0.010
" " Virginia	2.000	Valerian, Germany	0.950
Star anise, China	5.000	" Holland	1.000
" Japan	1.000	Veliver root	0.2–0.35
Storax	1.000	Water drop wort	1.300
Sumbul root	0.300	Worm seed, Levant	2.000
Tansy	0 150	Wormwood, herb	0.3–0.4
Thyme, wild	0.200	Zedoary root	1.300

The abstract in the "Amer. Drugg." embraces copious notes, giving the botanical titles of the plants or parts of plants, for which see the January number, 1888, 4–5.

Terebene.—Method of preparing an acceptable *emulsion*, which see under Pharmacy.

Terpin.—Formulas for *elixirs*, which see under "Pharmacy."

Terpin Hydrate—Properties and Uses.—Dr. Prosser James communicates his observations respecting terpin hydrate, as follows: Terpin hydrate has but slight taste, has no odor, and is solid. It appears as small needles when crystallized from a mixture of turpentine and water, or it may be obtained in large rhombic crystals by allowing alcohol (3 parts), turpentine (4 parts), and nitric acid (1 part), to stand in shallow dishes 3 or 4 days. It is slightly soluble in water or turpentine, but more readily by alcohol, ether, or hot water. It is best given in pills or in wafer. An emulsion may be used, but is not an agreeable form. It may, however, be dissolved in glycerin, and after solution an equal amount of syrup may be added. From 16 to 24 grains to the ounce in the latter admixture may be given in teaspoonful doses every 3 or 4 hours. It has been given in doses as large as 10 and 15 grains, but there is risk of disturbing the kidneys. It has the advantage over other terebinthinates of being tasteless, while its usefulness seems to be quite as great.—Amer. Drugg., April 1888, 64; from "The Lancet."

Oleum Pini Pumilionis—Therapeutic Value, etc.—Dr. Prosser James draws attention to this oil, which under the name of

Oleum Templinum, or "Krummholzöl," obtained by distillation of the young branches of *Pinus Pumilio* (the Mugho or Mountain Pine) with water, has long been known. It is the most potent agent in the so-called "pine cure" practiced at Reichenhall and other German spas, the vapor of the water, as it escapes into the inhalation rooms, being medicated with this oil. By improved apparatus and greater care in the selection of material, a much finer product is now obtained, in fact the pure essential oil, which has lately been supplied under the fanciful name of

Pumiline.—This essential oil possesses in a high degree the odor of the most fragrant variety of the pine, and, moreover, is less irritating than other fir oils. Sprinkled or sprayed about the sick-room, it imparts a lasting and grateful fragrance to the air, which is not oppressive, and appears to be disinfectant. It may be taken internally, and is admirably adapted for inhalation. For the latter it is better to diffuse the oil through water by the aid of magnesia, powdered silex, or talc, in the proportion 40 to 60 grains of oil, 20 grains of magnesia, and 1 ounce of water. A teaspoonful of this mixture is added to half a pint of cold water in the inhaler, when the addition of half a pint of boiling water gives a convenient temperature. Internally it is given in 5 minim doses, 1 or more, in capsules, emulsions, or on sugar, etc.—Amer. Drugg., April 1888, 64; from "The Lancet."

Pimaric Acid—Isomeric Modification.—Mr. Alb. Vesterberg, when preparing "dextropimaric acid" from galipot, obtained a second acid, which he named "β pimaric acid." He has now found this acid to be isomeric with dextropimaric acid ($C_{20}H_{30}O_2$), and being left-rotatory, has named it

Lævopimaric Acid.—He has obtained it in large handsome crystals and perfectly pure. It is insoluble in water, but readily soluble in other solvents. It melts at 140°–150°, crystallizes in rhombic crystals, and is characterized by its ready crystallizability, and by being one of the most powerful rotatory substances. It apparently readily forms crystalline salts. A comparison of the properties of dextropimaric and laevopimaric acid, causes the author to consider it probable that the "pyromaric acid" of Caillot is a mixture of these two acids.—Chem. Repert. (Chem. Ztg.), Jan. 22, 1888, 23; from Ber. d. D. Chem. Ges., 1887, 20, 3248.

Copaiva Oil—Oxidation Product.—Messrs. S. Levy and P. Engländer, by fractioning oil of copaiva, obtained a colorless terpen, $C_{20}H_{32}$ of s. g. 0.8978 at 24°, which by oxidation with bichromate of potassium and sulphuric acid, yielded a well defined crystalline acid, isomeric with *adipinic acid* ($C_6H_{10}O_4$). It is easily soluble in hydro alcohol and in ether, with difficulty in chloroform, benzol and bisulphide of carbon, and melts at 140°. It was recognized to be *Dimethylsuccinic Acid.* Several salts are described.—Pharm. Post, March 18, 1888, 183; from Liebig's Ann. Chem., 242, 189.

Camphor Oil—Variable Character.—Referring to a previous paper on camphor oil (see Proceedings 1885, 259), Mr. Peter MacEwan draws attention to the variable character of the camphor oils of commerce; some are colorless, others very dark, the latter being due to the heat employed in their preparation, and they have a very variable composition and sp. gr. Mr. MacEwan considers it very desirable that camphor oil should be brought to some state of uniformity before it gets into the hands of the retailers. Dark and heavy oils should be excluded. The rest should be bulked and subjected to distillation, rejecting all that will distil below 170° or 175 °C. The latter may be used for varnish makingt.—Yearbook of Pharm., 1887, 516–518.

Oil of Rose—Detection of Spermaceti.—Mr. G. Heppe recommends the following test for detecting the presence of spermaceti in oil of rose: Agitate a portion of the suspected oil with 1½ to 2 volumes of liquid glacial acetic acid. After a few minutes the mixture will solidify to a crystalline mass. Transfer the mass to a small filter and wash it with water, until it has lost nearly all odor of oil of rose. Then wash it with a little solution of soda. The undissolved residue consists (usually) almost entirely of spermaceti. It may be identified by transferring it to a dry test tube and heating it until it turns brown, when the characteristic odor of fatty acids will be evolved.—Amer. Drugg., April, 1888, 70; from Zeitschr. f. Anal. Chem.

Eucalyptol—A Component of Oil of Spike Lavender.—Mr. Voisy has obtained by the fractional distillation of the essential oil of *lavandula spica*, a body which he recognizes as identical with *eucalyptol* from eucalyptus oil and *cineol* from oil of semen contra. He proposes to give to this compound, inasmuch as it has now been separated from several oils, the name of "*terpane*," as indicating that it is an ether of terpine.—Pharm. Jour. and Trans., March 3, 1888, 744; from Jour. de Pharm. et. de Chim., Feb. 15, 1888, 231.

Oil of Erigeron—Character and Composition.—Prof. Fred. B. Power has examined oil of erigeron distilled on a large scale by Mr. A. M. Todd. The original distillate amounting to 100 pounds, had been redistilled by Mr. Todd, 93 pounds of rectified oil being obtained, whilst the residue in the still consisted of non-volatile, insoluble resin. The rectified oil is colorless, neutral to litmus, of pleasant odor, s. g. 0.8473 at 18° C. and 0.8498 at 15°. It distils over nearly completely between 175° and 180° C., only a small resinous residue remaining in the flask. On again distilling, the boiling was constant at 175° C. This last product was subjected to ultimate analysis, and was found to constitute a hydro-carbon of the composition $C_{10}H_{16}$. Pharm. Rundschau, Sept., 1887, 201.

Oil of Erigeron—Characteristic Constituent.—Prof. Flückiger, who has experimented with material supplied by Mr. Albert M. Todd, communicates to the latter that he has discovered in oil of erigeron a constituent which permits this oil to be sharply distinguished from

Oil of Fireweed—(Erechthites Hieracifolia).—This constituent was obtained in the form of a fine crystallized compound with bromine, which Prof. Flückiger has named

Limonen Tetrabromide.—It has the composition $C_{10}H_{16}Br_4$, and is formed by diluting one part of the oil of erigeron with ten parts of glacial acetic acid, and slowly adding bromine until, in the cold, crystals begin to appear. Sometimes several weeks are necessary to arrive at the formation of the bromide in the shape of crystals. They may be collected and recrystallized from warm acetic ether. No similar compound could be obtained from the oil of fireweed supplied by Mr. Todd.—Amer. Drugg., Aug. 1887, 152.

Oil of Fireweed (*Erechthites*)—*Characters and Composition.*—Prof. Fred. B. Power has examined oil of fireweed (Erechthites) supplied him by Mr. A. M. Todd. Twenty pounds of the crude oil had been subjected to rectification, 18 pounds of rectified oil being obtained, whilst 2 pounds of insoluble resin remained in the still. The so rectified oil was perfectly colorless, neutral to litmus, and had a pleasant odor, which was, however, distinct from that of oil of erigeron, with which it is sometimes confounded. Its sp. gr. at 15° C. was 0.8304. Subjected to distillation it begins to boil at 180° C., and the greater portion distills between 180° and 200° C., small quantities of distillate being obtained above that temperature, that passing above 300° C. being viscid and dark colored. By a second rectification the greater part passed between 185° and 190° C. This portion, which was colorless and strongly refractory, proved on analysis to be hydro-carbon, its boiling point indicating a molecular constitution corresponding to the formula $C_{15}H_{24}$. It therefore belongs to the class of sesquiterbenes, an assumption which is further supported by the previous observation of Beilstein, that while oil of fireweed will take up a molecule of chlorine, it does not form a crystalline compound with it.—Pharm. Rundschau, Sept. 1887, 201–202.

Oil of Hedeoma Pulegioides, Persoon—Analysis.—Mr. Frederick W. Franz, referring to the paper contributed by Mr. Ed. Kremers to this Association (see Proceedings 1887, 546–561), states that his results of an analysis of oil of pennyroyal were mainly obtained before the appearance of Mr. Kremer's paper. These results are therefore particularly interesting for comparison. Mr. Franz describes the oil as a yellowish liquid, slightly turbid, of a pungent, mint-like odor and taste, soluble in all proportions of alcohol, and having a faint acid reaction, which might easily be overlooked. Specific gravity of the dried oil at 15°C., 0.931; boiling from 180°-206°C. The dried oil left no greasy stain on paper, showing the absence of fixed oil. It gave no reactions with solution of ferric chloride, alcoholic solution of ammonium sulphide, nor with saturated solution of sodium bisulphite, indicating the absence of phenols or of aldehyde-like bodies; and nothing crystallized out when subjected, for three hours, to a temperature of —17°C.

The author's analysis of the oil under examination gave the following results: The oil is composed:

I. A body of the composition $C_{10}H_{18}O$, boiling from 217° to 218° C., and constituting about 33 per cent. of the original oil.

II. A body of the composition of $C_{10}H_{17}O$, boiling from 220° to 225° C. and constituting about 12 per cent. of the oil.

III. A body of the composition of $C_6H_{12}O$, boiling from 165° to 170° C. and constituting about 0.7 per cent. of the oil.

IV. Formic acid existing in a free state, about 0.5 per cent.

V. Acetic acid also in a free state, a small quantity only.

The oil was obtained from reliable source, and known to be pure.—Amer. Jour. Pharm. April, 1888, 161–168.

Referring to Mr. Franz's article on the volatile oil of *Hedeoma pulegioides*, Pers., Mr. Edward Kremers, in view of the material differences in the results of Mr. Franz from those obtained by him and detailed in his paper to this Association in 1887, makes some criticisms which point out certain discrepancies and incongruities in Mr. Franz's results, to which reference may be had in Pharm. Rundschau, May 1888, 103–104.

Volatile Oil of Monarda Punctata—Analysis.—Mr. Hermann J. M. Schrœter, in view of the imperfect knowledge concerning the chemical character of oil of horsemint (*Monarda punctata*, Linné), has subjected three samples of the oil to chemical investigation. One sample (No. I.) was a specimen from the museum of the Philadelphia College of Pharmacy; the other two (Nos. II. and III.) were procured from reliable sources. No. I. had been presented some six years ago. It was contained in a ten pint bottle, and about one-quarter of its volume was a crystalline deposit of thymol, having formed gradually by age. It was of reddish-yellow color, sp. gr. .926, strong mint-like odor and neutral reaction. Nos. II. and III. both had a brownish-red color, sp. gr., .920 and .922 respectively, somewhat fragrant and minty odor, and neutral to test paper. These were subjected several times to a temperature of —15° to —20° C. for several hours, but no separation of thymol occurred. The process described in the National Dispensatory was then tried as follows: The oils were subjected to fractional distillation; portions of the distillates obtained at above 200° C. were treated with solution of soda, the sodium compound separated and treated with HCl, but no thymol was obtained. The higher fractions obtained by fractional distillation from all three samples (225°–245° C.), were also subjected to a temperature of below —15°C, but all without yielding crystals of thymol. It was concluded that samples Nos. II. and III. had either previously been treated for thymol and separated, or else, being freshly distilled oils, had not become sufficiently changed to allow of the crystallization of that compound. This latter view, the author's further investigations, proved to be the correct one in all probability. The author enters into a detailed description of his investigations, the following being the most important constituents determined by him:

I. A hydrocarbon, of the formula $C_{10}H_{16}$, which has not previously been examined. It is lævogyrate, and is present to the amount of about 50 per cent.

II. Thymol, $C_{10}H_{14}O$, present to the extent of about 25 per cent., which is dextrogyrate. This body it seems is present in the freshly distilled oil in a condition which will not crystallize, even at a low temperature; but by age gradually becomes crystalline and separates, without, as far as appears, any change in chemical composition.

III. Higher oxygenated compounds, comprising $C_{10}H_{18}O$, and probably others. This portion is also dextrogyrate.

IV. *Formic acid.*—1. Its silver salt was reduced on boiling the solution. 2. Its lead salt was insoluble in alcohol, and gave characteristic reactions. 3. The free acid reduced $HgCl_2$ to Hg_2Cl_2 on boiling.

V. *Acetic acid.*—1. Its iron salt dissolved in water with bright red color, and was precipitated on boiling. 2. Its lead salt, when heated with As_2O_3, gave the kakodyl reaction. 3. The free acid caused the formation of white fumes with NH_4OH.

VI. *Butyric acid.*—Was detected by its odor, and exists in very small amount.

The oil having a neutral reaction, these acids probably exist as compound ethers; but are present in small amount only.—Amer. Jour. Pharm., March 1888, 113–121.

Volatile Oil of Asarum Europæum, L.—*Examination.*—Mr. A. S. F. Petersen has examined the volatile oil of *Asarum europæum*, L. Besides a terpene ($C_{10}H_{16}$), boiling at 162° to 165° C., and agreeing in its properties with the "pinene" of Wallach, its principal constituent is an oil boiling between 247° and 250°, having the empirical formula $C_{11}H_{14}O_2$ and being identical with the methyl ether of eugenol, which has hitherto not been observed in plants, but has been repeatedly prepared synthetically; by oxidation with potassium permanganate it yields dimethylprotocatechuic acid, and on treatment with hydriodic acid, methyliodide is produced. Near 300° a green or blue oil is obtained; the green fractions contain a considerable quantity of the stearopten asaron (boiling point 296°), the presence of which materially interferes with the investigation of the higher boiling portion. The author also examined the

Volatile Oil of Asarum Canadense.—He found the same terpene and oil, b. p. 245°–250° C., the latter being probably identical with the asarin of Power; a blue oil with a high boiling point is likewise present, and compound ethers, particularly of acetic acid, which are absent from the European oil. The American oil does not contain asaron.—Archiv. d. Phar., Feb. 1888, 89–123.

Volatile Oils of Asarum Canadense, L. and A. Europaeum, L.—*Distinctions.*—Prof. Frederick B. Power, referring to Dr. Petersen's analysis of the oil of *Asarum europaeum* (see above), and his own of *A. canadense* gives a comparative resumé of their composition. He concludes that the oil of *Asarum canadense* differs from the oil of *Asarum europaeum* in two respects. In the first place, by the former containing no asarone, and in the second place by containing the very fragrant body *asarol*, in combination with the volatile acids, acetic and valerianic. Dr. Petersen, indeed, observed that the odor of the natural oils of *Asarum europaeum* and *Asarum canadense* is very different; that of the latter being much more agreeable. The body existing in the oils from both species of *Asarum*, described as having the composition $C_{11}H_{14}O_2$, by Dr. Petersen, and $C_9H_{10}O_4$, by Prof. Power, deserves further consideration. As obtained from either source the substances are evidently identical, and, accepting Dr. Petersen's formula, which is evidently correct, it must be regarded as

Methyl eugenol (or *allyldimethyloxybenzol*). Both authors, by oxidation with permanganate of potassium, obtained veratric (or dimethylprotocatechuic) acid from this body. Asarum oils thus present the first instance of the natural occurrence of methyl-eugenol, which hitherto has been known only synthetically.—Pharm. Rundschau, May 1888, 101–102.

Diosphenol—Compounds and Decomposition Products.—See *Buchu Leaves* under "Materia Medica."

Volatile Oil of Adonis Vernalis, L.—*Characters, etc.*—See *Adonis Vernalis*, L., under "Materia Medica."

Oil of Lign Aloes—Characters and Source.—See *Mexican Lign Aloes* under "Materia Medica."

Oil of Evodia—Characters and Use as a Deodorant for Iodoform.—Mr. H. Helbing calls attention to the value of the volatile oil of *Evodia fraxinifolia* as a deodorant for iodoform: two drops added to an ounce of the iodoform completely deodorizing it. The author gives a description of the plant, taken from Christy's "New Commercial Plants," as well as of the fruits and the oil obtained from them. The fruit consists of three or four carpels placed together in the shape of a star; these are brown on the exterior, and dotted with small warty points; each carpel contains one seed of a roundish heart-shape and resplendent black color, and having a diameter of 4–5 mm. The fruit has a very strong odor, and yielded on distillation about 4 per cent. of a thin essential oil, of very pale color, a pungent smarting taste, and an intense odor similar to bergamot. Its sp. gr. is very low, not exceeding 0.840; it is soluble in alcohol and ether.—Yearbook of Pharm., 1887, 476–477.

Volatile Oil of Osmorrhiza longistylis, Rafinesque—*Characters.*—Mr. L. Eberhardt has subjected the volatile oil of the root of *Osmorrhiza longistylis*, Raf., to fractional examination. The root yielded 0.63 per cent. of the oil, which has the taste and odor of a mixture of anise and fennel oils; sp. gr. 1.0114 at 10° C.; soluble in alcohol (sp. gr. 0.830), ether and chloroform; congeals at 10–12° C., melts at 16° C., begins to boil at 189° C., but soon rises to 225°, between which temperature and 230° the greater part of the oil distils. From this fraction the portion distilling constantly at 226°–227° C. was isolated and proved to be pure anethol. Fractions were obtained boiling between 240°–250°, 250°–260° and 260°–280° C., a tarry residue finally remaining. These fractions, which were partially examined, constituted only a small proportion of the original volatile oil.—Pharm. Rundschau, July 1887, 140–150.

Oil of Wintergreen (Oil of Birch)—Therapeutic Uses.—Dr. E. R. Squibb, after reviewing the history of oil of wintergreen, as well as "oil of birch," which is at present almost exclusively found in the market under that name, makes some remarks on the therapeutic uses and value of the oil. The oil of birch does not appear to be a proper alternate for salicylic acid, or salicylate of sodium in severe cases of acute articular rheumatism, since it does not appear to relieve the pain nor reduce the temperature as promptly. It seems to be most appropriately used in the milder attacks of gouty rheumatism, cases which are very prevalent. The author regards the oil of wintergreen, whether the true oil of gaultheria or the oil of birch, to be very efficient in this direction. As to the dose, 10 minims may be given four to six times a day; but the dose may be increased until it causes ringing in the ears. In the dosage he cautions against the substitution of *drops* for *minims*, the drops being very uncertain in their size, and varying when dropped from different vials from 185 to 197 and 216 drops for 120 minims measured.—Ephemeris, Oct. 1887, 950–958.

Volatile Oil of Allium Ursinum—Vinylsulphide a Component.—Hitherto only one sulphuretted oil, free from nitrogen, has been known, viz., allylsulphide. Mr. Fr. W. Semmler has now determined a second,

Vinylsulphide, C_4H_6S or $(C_2H_3)_2S$, in the crude volatile oil of *Allium ursinum*. The crude oil carefully treated with metallic potassium, began to boil at 99°, and yielded the compound under consideration at 103° C. The results of the author's investigations are as follows:

1. The oil of Allium ursinum is composed substantially of vinylsulphide, which constitutes an oil boiling at 101° C., having the s. g. 0.9125, and an odor which is easily distinguished from that of allylsulphide. Besides this the oil contains a vinylpolysulphide and very small quantities of mercaptan and an aldehyd.

2. The pure vinylsulphide is obtained by the treatment of the crude oil with metallic potassium; by treating it with dry argentic oxide, it is converted into vinyloxide $(C_2H_3)_2O$, which boils at about 30° C.

3. By oxidation with nitric acid, permanganate of potassium and chromic acid, the vinylsulphide does not yield any sulphones, but is oxidized to carbonic, oxalic and sulphuric acids.

4. It produces with the mercuric and platinic chlorides, and with nitrate of silver, precipitates which are analogous to those of allylsulphide, and are in part crystalline.—Arch. d. Pharm., Oct. 1887, 927; from Liebig's Ann. Chem., 241, 90.

Volatile Oil of Mustard—A Preservative for Organic Liquids.—Mr. E. Schroder recommends the addition of a drop (or more, according to quantity) of essential oil of mustard for the purpose of preserving milk and the like for analysis. This will not interfere with the course of analysis.—Amer. Drugg., May 1888, 92.

Oil of Bitter Almonds—Chemistry of its Formation.—According to Liebig and Wöhler the amygdalin in the almonds is broken up under the influence of emulsin in the presence of water into glucose, hydrocyanic acid and benzaldehyd, the last named being commonly spoken of as oil of bitter almonds. Dr. O. Linde has now experimented and come to the conclusion that the action of emulsin is more limited, and that the decomposition of amygdalin is into glucose and *benzaldehydcyanhydrin* (C_6H_5-CH(OH)CN). During the distillation of the oil this compound is partially decomposed by heat into benzaldehyd and free hydrocyanic acid, a little of the latter combining to form ammonium cyanide. Benzaldehyd and benzaldehydcyanhydrin are both only very slightly soluble in water, and, therefore, separate for the most part from the aqueous distillate, while hydrocyanic acid and ammonium cyanide remain dissolved. The essential oil of bitter almonds would therefore, according to their view, consist of a mixture of benzaldehyd and benzaldehydcyanhydrin, but in variable proportions dependent upon the temperature at which the distillation was conducted, and the time occupied. About two years ago (see Proceedings 1886, 545–546), Mr. Braithwaite had determined the percentage of hydrocyanic acid in four samples to be 6.38, 5.3, 5.5, and 4.15 per cent. respectively. As benzaldehydcyanhydrin contains 20.3 per cent. of HCN, Dr. Linde calculates that these oils contained respectively 31.5, 26.0, 27.0 and 20.5 per cent. of that compound, the remainder being benzaldehyd. He suggests that it would be simpler and cheaper to replace oil of bitter almonds intended for medicinal use by definite mixtures of benzaldehydcyanhydrin and benzaldehyd.—Pharm. Jour. and Trans., Dec. 31, 1887, 537; from Pharm. Centralh. Nov. 15, 1887, 567.

Benzaldehydcyanhydrin—Preparation.—Mr. O. Linde gives the following method for preparing benzaldehydcyanhydrin, which he proposes to use in the preparation of bitter almond water (see under "Pharmacy") of definite composition. 3 p. of benzaldehyd are dissolved in 25 p. of alcohol; a solution of 2 p. of pure cyanide of potassium in 10 p. of water is now added, followed by the gradual addition of 20 p. of diluted sulphuric acid, shaking the mixture after each addition, and avoiding an appreciable rise in temperature. The mixture is extracted with ether, which leaves the cyanhydrin on evaporation. It is finally washed with water, and contains, when so prepared, 18 per cent. of HCN. It is possible, however, to prepare a product containing the full percentage of hydrocyanic acid, viz., 20.3 per cent., but not practicable for the present purpose. Benzaldehydcyanhydrin is a yellowoil, congealing sparingly at −10° C. having a peculiar odor.

Apiol—Characters and Oxidation Products.—Messrs. G. Ciamician and P. Silber have studied the characters and chemical constitution of apiol. The pure substance is a white crystalline body, having the composition $C_{12}H_{14}O_4$, melting at 30° and boiling at 294°. By boiling with alcoholic solution of potassa it is converted into an isomeric modification (first noticed by Gerichten), for which the authors propose the name

Isapiol.—This melts at 55° to 56°, and boils at 303° to 304°. It possesses physiological properties which differ very little from those of the unchanged apiol. By oxidation of the latter with permanganate of potassium in alkaline solution, a neutral substance melting at 222° and having the composition $C_{12}H_{16}O_6$ is formed, along with an acid,

Apiolic Acid, having the composition $C_{10}H_{10}O_6$, and melting at 175°. By the oxidation of apiol with bichloride of potassium and sulphuric acid,

Apiolaldehyd ($C_{10}H_{10}O_5$) melting at 102°, is formed. If apiolic acid is heated in a tube with dilute sulphuric acid to 130°–140°, carbonic acid is eliminated, and a new body,

Apion, having the composition $C_9H_{10}O_4$ and melting at 79° is formed. —Pharm. Post, June 17, 1888, 391–392.

ALCOHOLS.

Alcohol—New Method of Purification of the Last Runnings.—Messrs. Bang and Rufein have devised the following process for freeing alcohol, or rather the last runnings, from fusel oil and other volatile impurities. The alcohol residues are subjected in an agitator for one hour to the action of two per cent. of petroleum spirit (pure benzine), previously purified with sulphuric acid, and after standing, the supernatant benzine, containing nearly all the impurities, is drawn off. Agitation with fresh quantities of benzine is repeated till a small portion of the latter evaporates without leaving a bad odor. After the last evaporation the alcoholic liquid is distilled till all the alcohol is recovered, when it will be found quite clean enough for many purposes. The different benzine washings are distilled, which will leave the impurities in the still. A hitherto comparatively worthless residue is thus rendered quite valuable.—Drugg. Circ., Dec. 1887, 273; from Monit. des Produits Chim.

Alcohol—Purification.—Mr. E. Holz purifies crude alcohol by causing its vapor to pass through an alkaline copper solution, kept at the boiling point. Objectionable impurities, such as butyric, propionic or valerianic acids, are destroyed by the oxidizing action of the copper. The copper solution must be renewed from time to time, but the reduced oxide can be reoxidized and used again.—Pharm. Era, April 1888, 133.

Methylated and "Denaturalized" Spirit.—Mr. D. B. Dott draws attention to the propriety of so altering the British spirit law as to secure a methylated spirit that shall be absolutely unfit for drink. He refers to the "denaturirte spiritus" (denaturalized spirit) adopted by the German government for the same purpose, which consists of a mixture of 2 parts of wood spirit, 1 part of pyridine, and 100 parts of alcohol. The latter renders the alcohol not only malodorous but also poisonous, precluding its use for any but technical purposes. Mr. Dott advises a modification for the British excise laws, an admixture of 5 per cent. of wood naphtha and 0.5 per cent. of pyridine, which would, he thinks, combine the advantages of both systems.—Phar. Jour. and Trans., Feb. 25, 1888, 702–703.

Alcohol—Denaturation.—Dr. R. Kayser, to whom the subject of denaturating alcohol for technical purposes was referred by the Bavarian government, reports adversely on the use of pyridin-bases and methyl-alcohol, and recommends petroleum instead. The latter does not interfere with the use of the alcohol for technical purposes, and is preferable on sanitary grounds.—Chem. Ztg., Feb. 8, 1888, 184.

Cognac—Composition of its Fusel Oil.—Messrs. Claudon and Morin have separated the fusel oil of cognac by careful fractioning, and found it to have the following composition in 100 parts: water, 18.5; aethyl alcohol, 10.5; propyl alcohol, 8.3; isobutyl alcohol, 3.2; normal butyl alcohol, 34.5; amyl alcohol, 24.1; volatile oil, 0.9. The presence of normal butyl alcohol was of particular interest to the authors, since it explained the formation of free butyric acid in a sample of very old cognac which had become unfit for use on account of its presence. The presence of normal butyl alcohol is due to the action of *Bacillus butylicus*, which converts sugar, as well as any glycerin present, even in presence of 8–10 per cent. of ethyl alcohol, into butyl alcohol.—Arch. d. Pharm., Sept. 1887, 833; Jour. Pharm. Chim. xv., 631.

Barley Wine—Production and Characters.—Mr. Jaquemin, in the course of some experiments upon the elliptical beer yeast (*Saccharomyces ellipsoideus*) among other media endeavored to cultivate it in unmalted barley-wort to which acid tartrate of potassium had been added to prevent lactic fermentation and to approximate it in composition to grape must. No evidence was obtained in any case of the modification of the ferment, but it was observed that in the unmalted barley-wort the fermentation was quite different from that taking place in the formation of beer, and that the fermented liquor had the character of a true barley wine. This barley wine is described as being an agreeable beverage, giving upon analysis results that point to its being more nourishing than grape wine, while by using a large proportion of the cereal and by the addition of saccharose to the wort, it has been produced containing 8 to 10 per cent. of alcohol.—Pharm. Jour. and Trans., March 31, 1888, 824; from Compt. rend., cvi., 644.

Ether—Necessity for Stricter Requirements of Purity.—Dr. G. Vulpius has studied the causes of the decomposition of certain iodine compounds in ethereal solutions, notably of iodoform and iodide of potassium. He found that ether of strictly pharmacopœial purity will still cause the decomposition of the iodine compounds, particularly under exposure to light. The decomposing action is evidently due to impurity, since a specially purified ether, that is now an article of German commerce, does not decompose iodine compounds. He therefore advocates stricter requirements as to purity, the more particularly since ether is again gaining favor as an anæsthetic.—Arch. d. Pharm., March 1888, 261–265.

Ether—Tests of Purity.—Dr. Vulpius gives the following tests for the purity of ether: 1. When 5 c.c. of the ether are allowed to spontaneously evaporate to about 0.1 c.c., this residue must not turn blue litmus paper red. 2. If 10 c.c. of the ether are placed in a test tube with an equal quantity of water (so as to nearly fill the tube) and a few drops of phenolphthalein solution added, the watery stratum must be distinctly red after the mixture has been shaken. 3. A fragment of caustic potassa placed in the ether, must not become yellow within an hour. 4. If 10 c.c. of the ether and 1 c.c. of a ten per cent. solution of iodide of potassium are exposed to diffused daylight and frequently shaken during an hour, the mixture must show no discoloration.—Pharm. Era, Dec. 1887, 446; from Pharm. Centralh., 1887, 492.

Ether—Purification.—Mr. E. Dieterich, after trying in vain to correct the acidity with caustic potassa, succeeded perfectly with lime. Fifty grams of powdered quicklime were allowed to stand for a couple of days with five kilograms of ether, shaking frequently; then the mixture was transferred to a still, and the ether distilled off very slowly. It was found to be neutral and colorless.—Drugg. Circ., June 1888; from Helfenberg Annalen.

Bromide of Ethyl—Tests of Purity.—According to M. C. Traub, pure bromide of ethyl should be perfectly colorless; have a s. g. of 1.385 to 1.390; leave no residue on evaporation, nor a pungent or garlic like odor. Shaken in a perfectly clean glass stoppered bottle with an equal volume of pure concentrated sulphuric acid, neither of the fluids should be colored, even at the end of three or four days. Shaken with an equal volume of water, this should acquire no acid reaction with litmus, nor a reaction with nitrate of silver. Treated with dilute sulphuric acid and zinc, the gas evolved should not darken paper moistened with solution of acetate of lead. This latter test is important, because sulphur compounds are the most common and the most objectionable impurities in bromide of ethyl.—Pharm. Era, April 1888, 132; from Pharm. Centralh., 1887, 274.

Bromide of Ethyl—Anæsthetic Value.—Dr. Pauschinger concludes from his observations with bromide of ethyl as an anaesthetic, that it presents a number of important advantages, viz., freedom from danger, easy toleration by the patient, and convenient management, making it possible for the operator to dispense with an assistant. Its effect is both rapid and effective.—Pharm. Jour. and Trans., July 30, 1887, 89; from Münch. Med. Wochenschr., July 26, 1887, 568.

Iodide of Ethyl—Preparation.—Dr. E. R. Squibb finds the process of Beilstein and Rieth, slightly modified, to be the best, in his experience, for the preparation of iodide of ethyl. He uses 1000 grams of commercial resublimed iodine, 500 grams of clear alcohol, s. g. 0.814 to 0.820, and 100 grams of amorphous phosphorus. Without going into the details of the process as described by Dr. Squibb, it may be given briefly as follows: The alcohol and phosphorus being placed in a two liter flask, kept cool in cold water, iodine is added in portions of 100 grams about every 15 minutes with agitation by rotation for 10 minutes before each subsequent addition. When all has been thus added, the loosely stoppered flask is set aside for 24 to 48 hours, and the contents are then subjected to distillation in a salt water or dilute glycerin bath. The highly colored distillate (1230–1240 grams) is freed from iodine by treatment with dilute solution of soda, and is then rectified, the first portion of 100 cc. containing a little water, being collected separately. The well-known liability of the colorless ether to change cannot be prevented by any means known to the author, but the darkening can be prevented by placing a little dilute solution of soda upon the surface of the iodide of ethyl in each vial, which merely acts by saturating the iodine as it becomes free. The entire process from beginning to end should be conducted by artificial light of low intensity. The well protected vials should be preserved in a cool and dark place.—Ephemeris, June 1888, 1109-1113.

Acetic Ether—Detection of the Presence of Fusel Oil.—A writer in "Pharm. Ztg. f. Russl." states that the presence of fusel oil, which seems to be a frequent impurity in acetic ether, is detected by pouring into a perfectly dry test-tube a small quantity of pure concentrated sulphuric acid, and cautiously on top of that an equal bulk of the ether. If fusel oil is present, a brown ring appears with a more or less violet coloring of the ether.

Ethyl Nitrite—Expeditious Method of Preparing the Pure Ether.—Professor Dunstan and Mr. T. S. Dymond, after a comprehensive review and stúdy of the subject, find the following method to be admirably adapted to the production of pure nitrous ether in the nearly theoretical quantity without the use of heat, the ether, in the absence of excess of acid, being easily separated without ditillation. A solution is made by dissolving 34.5 grams of sodium nitrite in water. The liquid is diluted to 120 c.c. and cooled below 0° C. by surrounding the vessel which contains it with a mixture of ice and salt. The sodium nitrite of commerce contains from

95–98 per cent. of nitrite, and, therefore, a quantity corresponding to the pure salt must be taken. A slight excess of the salt does not interfere with the reaction. 13.5 c.c. of sulphuric acid are added to a cooled mixture of 32 c.c. of alcohol, with an equal volume of water, the liquid is then diluted to 120 c.c. and cooled below 0° C. This acid liquid is allowed to gradually pass through a thistle funnel with constant stirring to the bottom of the solution of sodium nitrite, contained in a long narrow glass vessel surrounded by ice and salt. The addition of the whole of the acid liquid occupies only a few minutes, and at its conclusion, a pale-yellow layer of ethyl nitrite is found to be completely separated from the lower layer of solution of sulphate of sodium, which is semi-solid from the separation of crystals of the salt. The ethyl nitrite so formed contains only traces of alcohol and water, the first being removed by agitation with cold water, the second by digestion with recently ignited anhydrous potassium carbonate. The yield is from 30 to 35 grams, the calculated yield is 37.5. It cannot be preserved under ordinary conditions without decomposition, but if kept in contact with fragments of anhydrous carbonate of potassium in a closely stoppered bottle, it may be kept for a long time without change. It boils at 17.5° C., and possesses at 0° C. a density of 0.917–0.920 (water at 0° C.=1). Analysis proves it to be nearly absolutely pure nitrite of ethyl. The author recommends for medicinal use a 2 per cent.

Solution of Nitrite of Ethyl in absolute alcohol. Its stability might be increased by the addition of 5 per cent. of glycerin; but even this is prone to change, though not as much as the solution in absolute alcohol simply, while the solution in rectified spirit changes to a still greater extent. The solution intended to be administered should not be diluted with water until just before it is to be taken.—Pharm. Jour. and Trans., April 14, 1888, 861–863.

Ethyl Nitrite—Review of Various Processes.—Mr. J. Geo. Spenzer reviews the various processes that have been employed for the preparation of pure ethyl nitrite. He finds the process of Liebig to give the best results. This consists in passing nitrogen trioxide, produced by heating a mixture of starch and nitric acid, into a mixture of one part of 85 per cent. alcohol and two parts of water and distilling, etc. The color of the product, by whatever process prepared, was invariably of a distinct pale yellow. The author finds the boiling point of 17° C., given by the French authorities for ethyl nitrite, to be nearly correct, while the s. g. at 15° C. does not vary much from 0.900.—Pharm. Era, July 1887, 249; from Proc. Ohio State Pharm. Assoc., 1887.

Nitrite of Ethyl—Effect of Inhalation.—Mr. J. Geo. Spenzer, while manipulating nitrous ether, studied the effect of the inhalation of its vapor, carrying it on as far as convenient. He formulates the symptoms into groups, as follows:

1. The first noticeable effects are irritation of the eyes, causing a watery congested appearance, followed by a slight headache and hoarseness.

2. The preceding intensify, a slightly accelerated pulse and nausea follow, and a purplish cast to the mucous membrane of the lips occurs.

3. The purple lips become blue, increasing in extent, with a similar condition of the finger-tips (first noticed underneath the finger nails) appears. This condition seems prominent because of the general pallor of the face and hands.

4. The pallid face becomes slightly flushed, while the cyanotic condition of the lips gradually spreads to the cheeks, the eyeballs being thoroughly congested and red.

5. The face and hands are now entirely blue, darker in those places where it started; extreme giddiness, nausea, muscular debility, loss of locomotion, violent congestive headache, rapid irregular pulse, dyspnoea and prostration soon follow.

The more disagreeable symptoms subsided after a few hours, while headache, dull pains in the chest, and rapid intermittent pulse, remained for some hours.—Pharm. Era, March 1888, 90.

Chloroform—Rectification.—Mr. Hermann Werner recommends the reduction of chloroform to the sp. gr. 1.483 at 17° C. by the addition of absolute alcohol, with a view to rendering it more permanent. The ready decomposition of chloroform is due to its great purity, *i. e.* absence of alcohol.* The chloroform should be washed with water until neither nitrate of silver or iodide of zinc-starch solution produces any change, absolute alcohol is then added in the proportion necessary to reduce the chloroform to the sp. gr. 1.481, a small quantity of chloride of calcium is added to the now turbid chloroform, which is shaken until it separates clear, decanted from the chloride of calcium, and rectified by distillation. The product has the sp. gr. 1.483 at 17° C., responds to all the tests of good quality, and keeps well.—Arch. d. Pharm., March 1888, 267–268.

Chloroform—Quantitative Estimation.—Mr. L. de Saint-Martin recommends a method for the quantitative estimation of chloroform, in chloroform water or other liquids, which depends upon the decomposition of the chloroform by means of alcoholic potassa, and the subsequent estimation of the chlorine as chloride of silver. Introduce 10 c.c. of the chloroform water into a strong glass tube closed at one end and drawn out at the other, then add 2 c.c. of very concentrated solution of potassa and 20 c.c. of alcohol. Seal the open end of the tube in the flame, and heat the glass tube in the water bath during three hours.

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*This fact was noted by Prof. J. M. Maisch in 1868, and is generally and well recognized in this country.—Rep.

Allow it to become cold, break off the pointed end, and transfer the contents to a beaker, washing the tube with distilled water to be added to the liquid in the beaker. Now titrate the solution in the usual way, with a decinormal solution of nitrate of silver. The author has found that saturated chloroform water contains 0.64 gm. of chloroform in 100 gm., or 1 in 156.—Amer. Drugg., May 1888, 88.

Chloroform—Tests of Purity.—Mr. M. C. Traub, referring to the observations of Dr. Vulpius respecting the necessity of greater exactness in the determination of the purity of chloroform, draws attention to the unreliability of the phenolphthalein test. He recommends the following tests as being indicative of a properly purified chloroform: 1. The chloroform must leave no residue even when evaporated in larger quantities. To determine this 100 c.c. of chloroform are subjected to distillation on a water bath. 2. The chloroform must be completely free from acid. Into a stoppered glass cylinder of 50 c.c. capacity, 25 c.c. of alcohol are placed, 10 drops of neutral purified alcoholic litmus tincture are added, and the cylinder is then completely filled with the chloroform to be tested, so as to leave no air space; after vigorous shaking it is set aside for 24 hours, during which time there should be no change in color. 3. The chloroform must not change the color of concentrated sulphuric acid during 24 hours. It will not, however, stand this test unless it has been carefully preserved in glass-stoppered bottles, the chloroform exercising solvent action upon cork. 4. Iodide of zinc starch solution must not be blued by the chloroform. 5. The chloroform when shaken with water should yield an aqueous solution, which is not changed by nitrate of silver solution. 6. The hydrogen eliminated from a mixture of chloroform, dilute sulphuric acid and zinc, should not affect paper wetted with a solution (1:2) of nitrate of silver. Aldehyd is the only impurity not determined by these tests, but no reliable test for its presence is at present available.—Arch. d. Pharm., May 1, 1888, 417–418; from Schweiz. Wochensch. f. Pharm., 1888, 89.

Chloroform—Increase in the Delicacy of the Tests of Purity.—Dr. G. Vulpius observes that chloroform that responds to the tests of the Pharm. Germ. may still contain appreciable traces of free acid. The delicacy of the tests might therefore be increased by the requirement that 10 c.c. chloroform and 2 c.c. water, which have been colored red by the addition of 2 drops of phenolphthalein solution and one drop of $\frac{1}{10}$ n. potassa solution, when shaken frequently, shall not become discolored during 24 hours; while the sulphuric acid test should require that no yellow coloration is produced within one day.—Arch. d. Pharm., Nov. 1887, 998–1001.

Chloroform.—Use as a Preservative for "Infusions," which see under "Pharmacy."

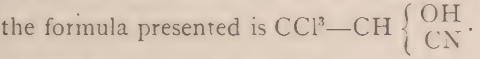
Chloroform—A Remedy for Mosquito Bites.—Dr. Gerard recommends to paint the part affected by mosquito bites with chloroform. The pain and itching are stopped at once, and the swelling is soon reduced. It can also be used for the sting of other insects.—Pharm. Post, 1887, 676.

Aldehyde—Detection in Alcohol.—Mr. W Winter states that by the aid of metaphenylendiamine hydrochloride he has been able to detect two-thousandths of one per cent. of aldehyde in alcohol. The reagent must be chemically pure, and requires to be kept in a desiccator over sulphuric acid to prevent deterioration. A freshly prepared solution of the salt in twice its weight of recently boiled water is introduced by the aid of a pipette into the alcohol to be tested. If aldehyde is present a color-zone forms at the plane of contact of the fluids, which is of a deep yellowish-red if more than 0.2 per cent. of aldehyde is present, and yellow, when the proportion is smaller. A yellow color which does not appear within five minutes is to be disregarded.—Pharm. Era, Dec. 1887, 447.

Chloral—Incompatibility with Cyanide of Potassium.—Attention is drawn to an explosive reaction resulting on triturating together 10 grams each of chloral and cyanide of potassium, to be incorporated with lard for ointment. Messrs. Blarez and Deniges, investigating the cause, did not meet with violent reaction, but observed changes which lead them to the following conclusions:

In preparing solutions of chloral and cyanide, the substances should be dissolved separately. This method adds also to the stability of the preparation, especially if the quantity of liquid used be large enough to lessen the chances of decomposition. But the authors think that physicians should abstain from associating chloral with potassium cyanide, the mixtures being really incompatible. As to the ointments, immediate reaction may be prevented by triturating the substances separately with the excipient. But the mixture turns brown in a few minutes, with disengagement of hydrocyanyic acid. Unguents of this nature should be rejected absolutely from therapeutic uses.—Bul. de la Soc. de Ph. de Bordeaux; Arch. de Pharm., May 5, 1888.

Chloralcyanhydrin (or Chloralhydrocyanin) — *Preparation, Characters, etc.*—Professor J. M. Maisch calls attention to this substance. He states that it was obtained in 1872 by Hagemann, by Pinner, and by Bischoff, by treating chloral with anhydrous hydrocyanic acid at an elevated temperature. A ready method for preparing this compound was given by Pinner (Berichte, 1884, 1997), and consists in dissolving chloral-hydrate in a 10 or 12 per cent. solution of hydrocyanic acid, obtained from potassium ferrocyanide equal in weight to that of the chloral hydrate; the solution is set aside for 24 hours, then for several hours digested, using a reversed condenser, and finally evaporated on the water bath. It crystallizes from water or carbon disulphide in thin white rhombic plates, melts at 61° C., boils with some decomposition between 215° and 220°, has an odor recalling that of hydrocyanic acid and chloral, and is readily soluble in water, alcohol, and ether. Its composition is represented by the formulas $C_3H_2Cl_3NO$ or $CCl_3 . CH (OH). CN$, and it is the nitrile of trichlorolactic acid, this acid being generated by strong hydrochloric acid. The solution in distilled water remains unchanged for some length of time, and does not produce a precipitate with silver nitrate, except after heating, when AgCy is deposited. Alkalies decompose the compound, yielding chloroform, hydrocyanic acid, and formic acid. The compound has been recommended as a substitute for hydrocyanic acid, of which it yields 15.5 per cent.; or 6.452 parts of chloralcyanhydrin correspond to 1 part HCy. 1.29 gm. chloralcyanhydrin dissolved in 9 gm. distilled water furnishes a solution corresponding in strength to the officinal 2 per cent. hydrocyanic acid; and a solution of 0.645 gm. in 100 gm. of water corresponds in strength to a bitter almond water with $\frac{1}{10}$ per cent. HCy.—Amer. Jour. Phar., June 1888, 273.

Hydrocyanate of Chloral—A Substitute for Aqua Laurocerasi, etc.—Mr. Hermes proposes hydrocyanate of chloral to replace the uncertain mixtures known as aqua lauro-cerasi, aqua amygd. amar., and their analogues. The physiological action of hydrocyanate of chloral is thought by Pinner and Bischoff to be the same as that of pure hydrocyanic acid; the formula presented is  $CCl^3—CH\left\{\begin{matrix}OH\\CN\end{matrix}\right.$. The aqueous solution gives pulverulent crystals forming in rhombs or prisms. It is readily soluble in water, alcohol and ether. With the vapor of water it volatilizes slightly, and decomposes into chloral and hydrocyanic acid. Alkalis also decompose it, with a reproduction of hydrocyanic acid. It is very stable. One part of anhydrous hydrocyanic acid is equal to 6.46 of hydrocyanate of chloral. To obtain a solution of equal activity to aq. dest. amygd. amar., 6 cgm. hydrocyanate of chloral is dissolved in 10 gm. of water.—Amer. Jour. Pharm., Jan. 1888, 13; from Pharm. Centralh., 1887.

Chloral Hydrate—Behavior with Camphor.—Mr. A. G. Georges has made some investigations on the behavior of chloral hydrate and powdered camphor; it is not stated whether the latter was absolutely free from alcohol or other liquid possibly used in powdering. Triturating together one part of the camphor and two parts of chloral hydrate, a colorless syrupy liquid of 1.280 specific gravity was obtained. Using equal parts of the two substances, the density of the liquid was 1.210, and it dissolved one-third part of camphor. The mixture of 7 parts of camphor and 3 parts of chloral is opaque, pulverizable, has the density of 1.10, and in contact with water is gradually decomposed, camphor rising to the surface and chloral hydrate entering in solution. The mixture of two parts of camphor and one part of chloral forms a partial solution, some camphor remaining undissolved, and the liquid portion will dissolve two more parts of chloral, before it is saturated with the latter. A solution of one part of chloral in (from one to) four parts of water will gradually dissolve four parts of camphor and deposit an oily liquid, which will neither mix with, nor be decomposed by, the water in which it was formed, even on heating it to the boiling point; but on the addition of more water, camphor will separate, and chloral be dissolved.—Amer. Jour. Pharm., July 1887, 334–335.

Chloral hydrate—A Possible Preventive of Rabies.—Dr. Brown-Séquard reports a series of experiments on rabbits and birds, in which he produced a kind of rabies by injecting oil of tansy. This rabies he was able to control by the vapor and subcutaneous injections of chloral, and he thinks that, from analogy, chloral is a preventive of true rabies.—Journ. Amer. Med. Assoc., Dec. 10, 1887; from L'Union Méd.

Chloral and Iodoform—Action on Certain Mercuric Salts.—Mr. S. Cotton has experimented on the action of chloral and iodoform on certain mercuric salts, and arrives at the following conclusions: 1. Chloral reduces the mercuric acetate, with the liberation of carbonic acid, and the formation of mercurous acetate. 2. Chloral reduces the mercuric nitrate and liberates carbonic acid, forming calomel. 3. Iodoform reduces the mercuric acetate with the disengagement of carbonic acid and the formation of mercurous acetate, precisely as with chloral. 4. Iodoform does not reduce the mercuric nitrate; its action is limited to the formation of the corresponding iodide. 5. Chloroform and bromoform do not act upon these salts.—Amer. Jour. Pharm., Jan. 1888, 13; from Jour. de Pharm. et de Chim., Dec. 1, 1887.

Trichlor-amidoethylic Alcohol—A Substitute for Urethan and Chloral.—Dr. Nesbit calls attention to trichlor-amidoethylic alcohol as a compound worthy of trial as probably combining the best qualities of urethan and chloral hydrate, the suggestion being based upon the theory that the objectionable action of chloral hydrate in paralyzing the respiratory centre and heart, would be counteracted if that compound could be modified by the introduction of an amidogen group. Such a compound is known by the above name, which Dr. Nesbit proposes to designate by the shorter name

Chloral Ammonium.—Preliminary experiments are stated to have given satisfactory results as far as they went. The compound may be obtained, according to Schiff, by passing a rapid current of dry ammonia through a solution of anhydrous chloral in dry chloroform as long as it is absorbed, pouring off the chloroform from the crystalline deposit, pressing this between bibulous paper, and drying in vacuo. The compound is said to have a peculiar odor and a taste resembling chloral, which is removed immediately on taking a couple of mouthfuls of water.—Pharm. Jour. and Trans., March 31, 1888, 822; from Therap. Gaz., Feb. 15, 1888, 88.

Iodoform—Prevention of Decomposition of Its Solutions by Light.—Mr. F. Coreil states that the discoloration of solutions of iodoform, due to liberation of iodine when exposed to light, is prevented if the solutions are kept in bottles of amber glass.—Phar. Era, April 1888, 135.

Iodoform—Modes of Disguising the Odor.—Experiments were made by Mr. W. M. Ross with a large number of substances which have been recommended for disguising the odor of iodoform. The following were found quite effectual: Carbolic acid, thymol, roasted coffee, and a mixture composed as follows: oil of neroli 1 p., oil of lemon 2 p., tinct. benzoin 2 p., acetic acid 1 p., to be digested with 100 p. of iodoform, in a stoppered flask at a temperature of 130° (F.? Rep.) for two days. The author recommends the use of roasted coffee. Other efficient substances, though less so than the above, are: a mixture of oil peppermint (1 p. c.) and carbolic acid (0.5 p. c.), oil of lavender, oil of bitter almonds, and a combination of oil of sassafras and oil of bergamot. Other agents are mentioned as possessing more or less utility, and some that have been recommended as being practically useless.—Phar. Era, Sept. 1887, 322; from Proc. Indiana Phar. Assoc., 1887.

Iodoform—Deodorization.—Mr. Cautrelle has found all the substances used for deodorizing iodoform ineffectual with the exception of the following, which he recommends: Iodoform, 1 gm.; menthol, 5 cgm.; oil of lavender (fine), 1 drop. He states that in this mixture the odor of iodoform will remain masked as long as the dressing remains in use.—Amer. Jour. Pharm., Jan. 1888, 13; from Bull. Gén. de Thérap., Nov. 15, 1887.

Iodoform—Method of Deodorization with Coffee.—Dr. Neale states that the effects of the deodorization of iodoform with coffee last only for a limited period, and the coarse particles of powder are apt to irritate the sore. These objections are overcome by digesting the ground coffee in melted lard or soft paraffin, which vehicles dissolve the deodorizing principles, and after straining form smooth and unirritating bases for ointments of iodoform.—Brit. Med. Jour., May 21st, 1887.

Iodoform.—Deodorization by *Oil of Evodia,* which see.

Formic Aldehyd—Action on Albuminoid Matter, etc.—Dr. Loew has studied the action of formic aldehyd (CH_2O), or "methyl aldehyd," as it is perhaps more frequently called, upon albuminoid matter, enzymes and living protoplasm. A solution containing 1 part of the gaseous formic aldehyd in 10,000 is stated to cause the death of algæ (*spirogyra*) in twelve hours. *Schizomycetes* are incapable of developing in a peptone cultivation liquid if it contain 1 part in 10,000; but *saccharomycetes* tolerate 1 part in 1000 for some time. Wood lice, worms (*Planaria*) and molluscs (*Planorbis*) die in from one to two hours if placed in water containing 5 parts of formic aldehyd in 10,000. Formic aldehyd acts upon some amido groups with great energy; but where the amido groups in a molecule are influenced by other groups, so that the movableness of their hydrogen atoms is diminished, they do not react at all, or only with difficulty, with formic aldehyd. Upon this behavior may depend the fact, observed by the author, that some enzymes, as pepsin or diastase, completely lose their activity after remaining in contact with formic aldehyd in neutral solution. But whilst pepsin and diastase either remain clear with formic aldehyd or only show a slight turbidity, other enzymes give a precipitate, notably trypsin, and to a less degree emulsin and papayotin.—Pharm. Jour. and Trans., June 30, 1888, 1085; from Münch. Med. Woch., June 12, 1888, 412.

Isopropyl-urethanes—Two new Compounds.—Spica has obtained two new urethanes, viz., α isopropyl-urethane and β isopropyl-urethane, by the action of α and β naphthylamine upon isopropylchlorocarbonate. α *Isopropyl-urethane* occurs in colorless needles having a bluish fluorescence, melting at 78° C., aromatic penetrant taste, soluble in alcohol, ether, chloroform and bisulphide of carbon, insoluble in water. It must be protected from light. β *Isopropyl-urethane* possesses in the main the same characters, but the crystals have a red fluorescence, and the melting point is 70° C.—Arch. d. Phar., Nov. 1, 1887, 978; from Ann. de Chim. e Farmacol., 1887, 366.

Sulfonal—Preparation, Characters and Uses.—Prof. John M. Maisch draws attention to sulfonal, a new hypnotic, which has been experimented with by Prof. A. Kast (Berl. klin. Wochenschr., 1888, No. 16), and was found to produce on animals no untoward or deleterious effects even when given in large doses. Taken by healthy persons, sulfonal has no effect, or merely produces a sensation of lassitude and fatigue, and but rarely induces sleep; but in patients suffering from wakefulness from various causes, sound and quiet sleep was produced in from thirty minutes to two hours, and lasting for from five to eight hours. The medium dose is from 2 to 3 gm., but even doses of 4 gm. given at short intervals alternating with medium doses have no ill effects.

Sulfonal is prepared by E. Baumann (*Berichte d. D. Chem. Ges.*, 1886, p. 2808) by oxidizing dithioethyl-dimethyl-methane with potassium permanganate in the presence of a little acetic or sulphuric acid. It crystallizes from boiling water in colorless thick prisms or plates, is inodorous and tasteless, sparingly soluble in cold alcohol, more freely soluble in ether, chloroform and benzol, and requires about 100 parts of cold water, or about 18 parts of boiling water for solution. It melts between 130° and 131° C., and boils near 300°; the yellowish distillate again yields the pure compound on recrystallization. Its composition is diethylsulfone-dimethyl-methane=$(CH_3)_2C\,(SO_2\,C_2\,H_5)_2$. It is not decomposed by boiling with alkalies. Hot sulphuric acid gradually decomposes it. It dissolves in concentrated sulphuric or nitric acid, and is reprecipitated on the addition of water. Its solution in bromine, on evaporation, leaves the unaltered compound.—Amer. Jour. Pharm., June, 1888, 274.

Sulphonal—Test of Identity.—Dr. Vulpius recommends as a test for the recognition of sulphonal the regeneration of mercaptan—of which the compound is a condensation product—by fusing a decigram of sulphonal with an equal weight of potassium cyanide, when a thick vapor is at once given off, having the unbearable odor of mercaptan in a high degree.—Pharm. Centralh., May 17, 1888, 245.

Mr. Ritsert, referring to the above test, objects to the use of potassium cyanide, and proposes pyrogallic acid as a non-poisonous substitute. He heats one or two decigrams of sulphonal in a dry test-tube until at about 280° C. the water-clear fused mass begins to give off bubbles of gas. From 0.05 to 0.1 gram of pyrogallic or gallic acid is then added, which causes the clear liquid to become brown and evolve the characteristic mercaptan vapor.—Pharm. Jour. and Trans., June 2, 1888, 1005; from Pharm. Zeitung, 1888, 312.

Sulphonal—Solubilities, etc.—Dr. Scholvien finds that one part of sulphonal requires for solution 15 parts of boiling water, 500 parts of water at 15° C., 133 parts of ether at 15° C., 2 parts of boiling alcohol, 65 parts of alcohol at 15° C., and 110 parts of 50 per cent. alcohol at 15° C. After three recrystallizations from different solvents, the melting point of sulphonal was found to be uniformly at 125.5° C., which the author thinks can be taken as that of a pure product.—Pharm. Jour. and Trans., June 2, 1888, 1005; from Pharm. Ztg., May 30, 1888, 320.

Sulphonal—Hypnotic Value.—Dr. T. E. Lovegrove's experience with sulphonal is not very encouraging. For several hours after the drug had been taken no appreciable effects could be observed in the patients, but during the greater part of the following day there was extreme drowsiness and considerable cyanosis. On account of its sparing solubility, it is best to administer sulphonal suspended in water by the aid of comp. tragacanth powder.—Brit. Med. Jour., May 26, 1888, 1113; Pharm. Jour and Trans., June 2, 1888, 1005.

Amylene Hydrate—A New Hypnotic.—Mr. von Mehring draws attention to a new hypnotic—amylene hydrate. It is obtained by distilling trimethylethylene with sulphuric acid, the amyl-sulphuric acid first formed being by the distillation broken up so as to form the new tertiary alcohol, more scientifically named

Dimethylethylcarbinol.—Amylene hydrate is a clear colorless liquid, having a penetrating odor, recalling camphor, oil of peppermint and paraldehyde. It is dissolved readily in 19 parts of water, and in all proportions in alcohol, boils, when pure, at +102° C., and solidifies at —12 5° C.; s. g. at 0°=0.828, at +12° C.=0.812. It is liable to be contaminated with amyl-alcohol. As a hypnotic it is said to stand midway between chloral and paraldehyd in respect to potency, 2 grams being equal to 1 of chloral, or 3 of paraldehyd. It has been given in doses of 4 grams.—Pharm. Jour. Trans., July 30, 1887, 89; from Phar. Ztg., July 9, 1887, 393.

Amylene Hydrate—Administration.—Amylene hydrate, reported to be useful in doses of 60 to 90 grains in cases of alcoholism, morphiomania, epilepsy and tuberculosis, may be given in the following form, the dose being taken on retiring: Amylene hydrate, gr. lx.; distilled water, ʒx.; syrup of raspberry, ℥j.; oil of peppermint, gtt. j.—Amer. Drugg., April 1888, 76.

Methyl Alcohol—Methods of Purification.—Mr. Emil Huber, after having tried all the different processes recommended in the books, came to the conclusion that neither of these yielded a sufficiently cheap product; and lime suggesting itself as a cheap reagent for the purpose, he began a series of experiments with an alcohol that boiled at 68° C., and had a specific gravity of .826. By treating with oxalic acid, methyl oxalate was formed. The still being ready, a quantity of dry carbonate of potassium was added, and then the lime in small lumps, quickly connecting with the condenser. In a few minutes the reaction goes on by itself, or sometimes requires the aid of a little heat; distillation is stopped when but about one-sixth of the quantity is over.

As it first comes over methyl alcohol is odorless, and keeps so for quite a while, but on exposure to the atmosphere it soon acquires that well-known peculiar odor, but not as strong as the commercial alcohol, and not empyreumatic. Then, after treating with carbonate of potassium, distilling and adding a few grains of permanganate of potassium to the distillate, the odor is destroyed, but comes back again, though more pleasant and less disagreeable. In this condition, and by a little more purification, he thinks it can be used in some preparations. The alcohol obtained had the sp. gr. .889, and boiled at 66° C.—Amer. Jour. Pharm., March 1888, 129–130.

Wood Alcohol—Satisfactory Commercial Quality.—Mr. Wm. H. Clark has subjected three commercial samples of wood alcohol to examination, and finds them to come very close up to the requirements for a good article:

The specific gravity of No. 1 at 20° C., was 7962
" " No. 2 " " 8136
" " No. 3 " " 8049
No. 1 commenced to boil at 61° C., was constant at . . . . . . 68°.
No. 2 " " " 64° C., " " . . . . . . 68°.
No. 3 " " " 64° C., " " . . . . . . 68°.

On adding 10 c.c. of saturated solution calcium chloride to 5 c.c. of each, no layer separated, showing absence of large quantities of acetone.

Tested for acetone by the method recommended by A. H. Allen, in his "Commercial Organic Analysis," the samples were found to contain respectively 2.3, 2.73 and 2.70 per cent. acetone, which by further treatment with iodine solution was increased to a total of 2.58, 4.15 and 3.97 per cent. respectively.

As a cheap solvent in place of grain alcohol for commercial and scientific uses, this alcohol, as now obtainable in the market, promises to take an important position, and it is evident that if sanctioned by the United States Pharmacopœia it might be used in many pharmaceutical processes.—Amer. Jour. Pharm., Dec. 1887, 605–606.

Chloride of Methyl—Value as a Local Anæsthetic.—Dr. Bailly, who uses the actual cautery largely in his practice, states that in search for the best local anæsthetic he had used ice and salt, cocaine, with and without phenic acid, etc., but found them all inferior to the chloride of methyl spray as used by Debove. As soon as the skin becomes whitened, the spray should be discontinued and the cauterizations commenced at once. These are effected without pain.—Amer. Jour. Pharm., Dec. 1887, 614; from Prog. Méd., Oct. 15, 1887.

Methylal—Value as a Hypnotic in Certain Stages of Insanity.—According to recent observations of Messrs. Mairet and Combemalle, methylal, though without effect in alcoholic insanity and in the early stages of simple insanity, generally succeeds in the crises of the latter, in the insomnia of simple dementia, in atheromatous dementia, and in paralytic dementia. The doses necessary to induce sleep in these cases vary from 5 to 8 gm. In five or six days, patients become so habituated to it that the amount of sleep then diminishes, even if the dose be augmented. Intervals of two or three days should therefore elapse between each series of doses. The action of methylal is exclusively hypnotic; its use has never caused functional troubles of the great organs. It is so safe, so easily prepared and so agreeable to patients, that it should have a place in hypnotic medication in mental alienism.—Amer. Jour. Pharm., Jan. 1888, 12; from Le Prog. Méd., Oct. 1887.

Phenic Acid—Measuring by Drops.—Mr. Fleury finds that for small quantities of the diluted phenic acid a correct dropper is much more accurate than a scale. He also says that the use of 95 per cent. alcohol as a diluent gives rise to great variations in the strength and character of the mixture. He uses a solution of equal parts by weight of acid and of alcohol of 60 per cent. Mr. Fleury adopts this because solutions of phenic acid and strong alcohol are volatile and would soon possess a disproportionate amount of acid; and, finally, the influence of temperature upon the weight and volume of the drops is increased in proportion to the amount of alcohol contained in them.—Amer. Jour. Pharm., Dec. 1887, 613; from Jour. de Pharm. et. de Chim.

Carbolic Acid—Assay of Commercial Compounds.—Messrs. J. Muter and L. de Koningh recommend the following methods for the assay of commercial carbolic compounds:

1. *Carbolic Powders.*—When the phenols exist in the uncombined state, they are extracted from 75 grams of powder by methylated spirit (or alcohol ? Rep.) When the powder contains a lime base, a preliminary thorough trituration with a small excess of dilute sulphuric acid is necessary. The alcoholic extract is mixed with 200 c. c. of a five per cent. solution of sodium hydroxide, and the mixture is then evaporated to half its bulk. At this point any tar oils and naphthalene will separate, and are to be filtered off. The filtrate is further concentrated to 50 c. c. and transferred to a graduated tube. This, which is known as

Muter's Carbolimeter is wide in the lower portion. At 65 c.c. it is narrowed to a neck, which is graduated up to 110 c.c. in 0.25 c.c. divisions. It is stoppered, and is furnished with a long, thin, stirring rod, the volume of which must be allowed for. The solution is made up to 65 c.c., 25 c.c. of strong hydrochloric acid are slowly added with stirring, and then enough dry common salt to render the phenols insoluble. The tube is plunged into water of 15.5° C. and the volume of phenols read off.

2. *Liquid Carbolic Acid.*—If it contains excess of water it will not give a clear solution with 3 volumes of benzol. The amount of water is ascertained by shaking 20 c.c. of the sample with 80 c.c. of saturated solution of sodium chloride, and observing the diminution in the volume of the acid. Tar oils are estimated by shaking 20 c.c. of the sample with 80 c.c. of 5 per cent. solution of soda and a small quantity of benzol (10 c.c. for dark specimens, and less for pale ones). The increase in the volume of the benzene gives the amount of tar oils; the remainder is taken as phenols and cresols.—Amer. Drugg., April 1888, 70; from The Analyst, 12, 191.

Carbolic Acid—Valuation of Commercial Compounds.—Messrs. John Muter and L. de Koningh have devised and communicate processes for the valuation of the commercial carbolic compounds used for sanitary purposes, which they communicate in a lengthy paper, and which are based on the following well-known data:

1. Phenol, cresol, and their homologues are completely soluble when shaken up with a five per cent. solution of sodium hydrate.

2. Liquefied phenol and the corresponding cresol are insoluble in a saturated solution of sodium chloride.

3. In the presence of a sufficient excess of alkali, even a largely diluted solution may be boiled down without the slightest appreciable loss of phenol or cresol.

4. Tar oils and naphthalin are only very slightly dissolved by the alkali, and may be perfectly removed from the solution by agitating it with benzol.

The processes are modified so as to be applicable to the different powders and commercial acids, but are too circumstantial to find place here, and may be consulted in Amer. Jour. Pharm., Nov. 1887, 581–585, or in "The Analyst," October, 1887.

Carbolic Acid—Removal of Red Color.—Mr. J. Demont recommends the following method for decolorizing carbolic acid that has turned red. Melt it on a water-bath and mix 89 parts of the acid with 11 parts of alcohol. The resulting solution is allowed to cool, and when the greater part has crystallized, the excess of liquid is poured off and the crystals are well drained. The crystals are pure white, and yield when melted an entirely colorless or only slightly reddish acid.—Pharm. Ztg., 1887, 746; from Der Fortschritt, 1877, No. 22.

Carbolate of Mercury—Preparation, Characters, etc.—Mr. Charles Albur suggests the preparation of carbolate of mercury as follows: Dissolve 271 grains of bichloride of mercury in 8 fl. oz. of alcohol. Into this pour a solution of 264 grains of carbolate of potassium in 2 fl. oz. of alcohol, then add about ½ fluidrachm of carbolic acid, and set the mixture aside for 36 hours, during which the orange-red precipitate first formed changes to white. The precipitate is washed on a filter with distilled water until the washings cease to give a violet-blue color with ferric chloride (absence of free carbolic acid), or a white precipitate with nitrate of silver (absence of chloride), and is finally washed with alcohol, allowed to drain, and dried between 90° and 100° C. Thus obtained, carbolate of mercury is a white amorphous powder, odorless and tasteless, insoluble in water, very sparingly soluble in alcohol, scarcely soluble in cold, but readily soluble in boiling hydrochloric acid.—Amer. Drugg., June 1888, 102.

Neosote—A Crude Compound of Phenols from Blast Furnaces.—Mr. Alfred H. Allen, after reviewing the characters of the different grades of "carbolic acid," properly and improperly so called, and laying stress upon the inefficiency of some of the compounds as disinfectants, particularly the powders containing lime as base, draws attention to the phenoloids obtainable from blast furnace tar, which, approximating more closely to those from wood-tar than do the coal-tar acids, seem to be particularly suitable as disinfectants. Such a product is now being introduced under the name of "neosote" (signifying "new preserver") suggested by him. Refined "neosote," when freshly prepared, is almost as colorless as water, but it acquires a sherry color by keeping. Direct comparative experiments prove it fully equal as an antiseptic to the best grades of "crude carbolic acid," over which it has the advantage of being far less caustic. In fact, when properly purified, it has considerable resemblance to wood-tar creasote. In point of the percentage of phenoloids, also, it compares favorably with the best grades of crude carbolic acid, containing in its crude condition 89.7 per cent., and in its refined condition 98.7 per cent., against 90.7 per cent. in the crude carbolic acid.—Yearbook of Pharm., 1887, 566–571.

Creolin—Characters and Uses.—Prof. J. M. Maisch draws attention to "creolin." It is a product of the dry distillation of coal, and forms a blackish brown, almost syrupy and viscous liquid, having a tar-like odor, and when dropped in water, forming delicate white clouds, a single drop rendering from 250 to 300 c. c. water uniformly milky and opaque. It has been employed by Dr. J. Neudoerfer (Pharm. Post, 1888, 24) as an antiseptic for wounds and in several cases of erysipelas, and was usually applied by means of gauze, previously freed from fat, in the form of solution of two drops to 200 c. c. water. An examination of creolin by Mr. A. Gawalowski (*ibid.* p. 229) elicited the following: It is thickish, clear, of a dark granate red to chestnut brown color; has a vinous aromatic taste with a pungent soapy and burning after-taste, and a tarry odor; reaction neutral; spec. grav. at 17.5°C., 1.066; soluble in all proportions of absolute alcohol, also in 95 per cent. alcohol, chloroform, and in ether and acetic ether; soluble clear in 1.7 parts of 70 per cent. alcohol, with more becoming turbid; partly soluble in petroleum benzin, leaving a tarry black brown residue; insoluble in wood spirit, becoming flocculent, then oily; with carbon disulphide forms a light brown emulsion and separates a tarry layer, becoming whitish-yellow and oily; with water forms a milky greenish-yellow liquid; with acidulated water yields a brownish emulsion separating a supernatant fatty layer; with alkaline water gives a dingy yellow permanent emulsion, and with glycerin likewise an emulsion separating an oily layer. Subjected to heat, creolin yielded a distillate at 100° C. amounting to 45.0 per cent.; between 100° and 147° C. 26.33 per cent., and left tarry residue 22.90 per cent. and ash 5.77 per cent. The saponifiable fat acids and resins amount to 0.30 per cent.; resin readily soluble in alcohol (possibly guaiac) 0.78 per cent.; tar bases 0.48 per cent., tar compounds combining with alkali 61.88 per cent. The ash contains sodium with traces of potassium. The portion soluble in benzin was 72.8 per cent., and had an aromatic naphthalin-like odor. Naphthalin, fluorescein, aniline, toluidin, phenol and picric acid were determined qualitatively. According to this analysis, creolin consists mainly of coal tar, with the addition of some resin soap, fat soap, and caustic soda. For the internal administration of creolin the form of mixture does not appear to be adapted; for on diffusing 0.05 gm. of it in 25 gm. of water, and adding 5 drops of this emulsion to 60 gm. of syrup of marshmallow, the syrupy mixture still had a very persistent tarry and soapy taste.—Amer. Jour. Pharm., June 1888, 276.

Sozoiodol—A New Derivative of the Aromatic Series.—Sozoiodol is described as a derivative of the aromatic series having the constitution of a phenol whose atoms of hydrogen are replaced by the radical (SO_3H) and an atom of iodine. It takes the form of a brilliant crystalline powder, is inodorous, and dissolves sparingly in cold water and in cold alcohol. It holds 42 per cent. of iodine and is said to be equally efficacious with iodoform and salicylic acid in dermatoses. It appears to owe its only advantages to its absence of odor.—Amer. Jour. Pharm., May 1888, 239; from L'Union Pharm., Feb. 1888.

Iodophenols—Uses in Dyeing.—According to "Moniteur Scientifique," the iodophenols will have an important application in dyeing, their blue and violet tints being remarkable for durability, while the cost is very low. The process of dyeing with blue iodophenol is very simple, and differs but little from that with indigo. The reductive product of iodophenol is prepared by diffusing the blue iodophenol paste in alkaline liquor with glucose, and heating to 80° [176° F.]. The mixture takes a greenish hue and has a striated appearance, with bronze reflexes on its surface. The liquor is then diluted with warm water, when the cotton fabric is dipped. When the proper shade of color is obtained, the fabric is pressed and exposed to the air, or to an oxidizing bath; the latter is best made with an ammoniacal solution of a cupric salt.—Amer. Jour. Pharm., June 1888, 289.

Creasote—Effect on the Hair.—Dr. C. W. Kelly reports the case of a man who by mistake had used creasote in the place of hair oil; on the following morning the color of the hair was observed to have commenced to change, and in a few days it was quite gray.—Amer. Jour. Pharm., Sept. 1887, 441; from Prov. Med. Jour., 1887.

Guaiacol—Tests of Purity.—It is stated by "F" (in Ztschr. f. angew. Chem.," 1888, 12) that the guaiacol of commerce contains only about 25 per cent. of pure guaiacol, and that for medicinal use it requires careful purification. The author recommends the following additional tests of quality: 1. A small portion of guaiacol is shaken with some petroleum benzin at 20°. The pure article separates rapidly and completely, whereas the commercial guaiacol forms a clear solution. 2. If 5 c.c. of guaiacol are mixed with 10 c.c. of glycerin, s. g. 1.19, pure guaiacol separates completely, guaiacol of 70 per cent. separates for the greater part, while commercial guaiacol (35 per cent.) is dissolved. 3. When 2 c.c. of pure guaiacol are mixed with 2 c.c. of soda solution, s. g. 1.30, the mixture becomes warm, and on cooling at the temperature of the room congeals to a white crystalline mass; in the case of the 70 per cent. or the 75 per cent. guaiacol, the mixture remains fluid. This latter test, along with the s. g. (1.1171 at 13°) and the boiling point (200°–202°) are particularly important.—Chem. Repert. (Chem. Ztg.), Jan. 22, 1888, 24.

Guaiacol—Preference to Creasote.—Dr. Sahli recommends guaiacol as a substitute for creasote, owing to the uncertainty as to the purity of the latter. For its internal administration he proposes the following formula: Guaiacol, 2 gms.; alcohol, 20 gms.: water, 180 gms.; dose, from a teaspoonful to a tablespoonful two or three times a day, after eating. The mixture should be kept in black glass.—Amer. Jour. Pharm., May 1888, 239; from Jour. de Phar. d'Als.-Lorr., Jan. 1888.

Dinitrocresol—Dangerous Character.—Mr. Weyl, in a report before the Berlin Medical Society, advises that the sale of dinitrocresol be prohibited. It is offered for sale in the market as a substitute for saffron, and in a recent case in Berlin, made public, it was shown that used internally it had caused death. In making a purchase from an apothecary, dinitrocresol was given instead of saffron, as asked for, and its internal use, probably as an emmenagogue, produced fatal results.—Rundschau, Prag, 1887, 959.

Glycerin—Specific Gravities of Various Dilutions.—Prof. W. W. J. Nicol has determined with great care the specific gravities of pure glycerin and of various mixtures of glycerin and water. The determination was made at 20° C., water at the same temperature being taken as the standard of comparison. His results are given in the accompanying table, together with the corresponding specific gravity at 15° C., calculated from data on expansion of glycerin solutions furnished by Dr. A. B. Lyons, the standard of comparison being water at the same temperature:

Per Cent. Glycerin.	Nicol s. g. at 20° C. =68° F.	Lyons s. g. at 15° C. =59° F.	Per Cent. Glycerin.	Nicol s. g. at 20° C. =68° F.	Lyons s. g. at 15° C. =59° F.
1	1.00235	1.00236	51	1.13104	1.13265
2	471	473	52	377	539
3	708	711	53	650	814
4	945	949	54	923	4088
5	1184	1189	55	4196	362
6	423	430	56	469	637
7	664	673	57	742	912
8	905	917	58	5015	5187
9	2148	2163	59	288	462
10	391	409	60	561	737
11	635	655	61	834	6011
12	880	910	62	6107	286
13	3126	3177	63	380	561
14	373	410	64	654	837
15	622	652	65	928	7113
16	872	905	66	7201	387
17	4124	4160	67	474	662
18	377	416	68	747	937
19	630	672	69	8020	8212
20	884	930	70	293	487
21	5139	5189	71	565	761
22	394	449	72	837	9035
23	652	712	73	9109	309
24	908	973	74	381	583
25	6166	6236	75	653	857
26	425	500	76	925	.20131
27	685	765	77	.20197	404
28	946	7031	78	468	677
29	7207	297	79	739	949
30	469	564	80	1010	1221
31	731	832	81	281	493
32	994	8100	82	552	766
33	8258	370	83	823	2038
34	522	639	84	2094	310

Per Cent. Glycerin.	Nicol s. g. at 20° C. =68° F.	Lyons s. g. at 15° C. =59° F.	Per Cent. Glycerin.	Nicol s. g. at 20° C. =68° F.	Lyons s. g. at 15° C. =59° F.
35	786	908	85	365	583
36	9051	9176	86	636	855
37	317	445	87	907	3128
38	583	713	88	3178	400
39	850	983	89	449	673
40	.10118	.10253	90	720	945
41	387	525	91	990	4217
42	657	798	92	4259	487
43	927	1071	93	526	756
44	1198	345	94	790	5021
45	469	618	95	5052	285
46	741	893	96	312	547
47	2013	2167	97	572	809
48	285	441	98	832	6072
49	558	716	99	6091	335
50	831	990	100	348	595

—Pharm. Era, Feb. 1888, 55.

Glycerin—Volumetric Estimation.—The following volumetric method for the estimation of glycerin is proposed by Hehner: Three solutions are required: (1) 74.86 grams pure bichromate of potassium and 150 c.c. strong sulphuric acid in 1 liter. (2) 120 grams ammonio-ferrous sulphate in 1 liter; the strength being adjusted exactly to that of No. 1. (3) One liter contains 100 c.c. of No. 1. To carry out the assay, add to the solution, which must not contain more than about 0.2 gram of glycerin, one-tenth its volume of strong sulphuric acid and 25 c.c. of solution No. 1. Heat the mixture on the water-bath two hours, then add from a burette a slight excess of solution No. 2, and finally titrate back with solution No. 3, using ferricyanide of potassium as indicator. Divide the number of c.c. of solution No. 3 thus used by 10, and deduct from the number of c.c. of No. 2 consumed. Subtract the remainder from 25, and the result will be the quantity of glycerin in centigrams. The process and calculations are based upon the fact that solutions of glycerin, containing more than one part in one thousand, when heated two hours in presence of bichromate of potassium and sulphuric acid, produce a constant definite reducing effect, one part of glycerin reducing 7.486 parts of bichromate. If alcohol is present in the solution under examination, this must be removed by evaporation.—Pharm. Era, 1888, 22.

Glycerin—Simple Method of Estimating in Fluid Extracts, etc.—Mr. A. J. Baumhardt has experimented with two methods, already well known, with a view to determine their applicability to the estimation of glycerin in fluid extracts. The first one of these is that of Reichard and others, and excels in simplicity. To 5 c.c. of the fluid extract 0.5 gram of freshly slaked lime was added, and the mixture evaporated to dryness in a long flask upon the water-bath. The residue was digested with a mixture of 7 c.c. of ether and 23 c.c. of alcohol of 95 vol. per cent. for several hours, filtered, and the filtrate evaporated in a long-necked flask on a water-bath to constant weight, the residue being calculated as glycerin. Absolute alcohol may be substituted for the mixture of ether and alcohol in some cases. A table of results obtained with this method shows it to be sufficiently accurate for practical purposes. The second method is more recent, and was proposed by Benedikt and by Fox. It consists in the oxidation of glycerin to oxalic acid, the liquid being rendered strongly alkaline with caustic alkali, and treated with powdered permanganate until it retains a permanent pink color. By suitable means the quantity of oxalic acid formed is determined, and from the quantity ascertained the amount of glycerin is calculated. While the results of this second method are more precise, the process is too circumstantial for general utility. Moreover, certain plant constituents, notably those of belladonna, wild cherry, quassia, uva ursi, and juglans, yield oxalic acid by the action of permanganate, though in most cases only traces.—Pharm. Era, Jan. 1888, 10–11.

Glycerin — New Method of Estimation.—Mr. R. Dietz proposes to precipitate glycerin as an insoluble benzoate, and collect and weigh the precipitate. He adds to the solution containing glycerin benzoic chloride and caustic potassa, digests the mixture with frequent shaking for fifteen minutes, collects the precipitate on a tared filter, dries at 100° C. and weighs. One gram of the precipitate contains 0.253 gram of glycerin, somewhat more than the theoretical quantity.—Pharm. Era, Nov. 1887, 408; from Ztsch. Physiol. Chem., xi. 472.

Glycerin — Identity as to Purity whether from Animal or Vegetable Fats.— Mr. William H. Clark, having selected the best commercial representatives of the vegetable and animal glycerins, subjected them to comparative tests and communicated the results at a Pharmaceutical meeting of the Philadelphia College of Pharmacy (Nov. 15, 1887). These results show that both glycerins comply with the requirements of the United States Pharmacopœia, and that they do not differ materially even on extreme tests.—Amer. Jour. Phar., Dec. 1887, 608.

Spurious Glycerin—Alleged Occurrence.—It having been stated that a spurious glycerin—composed of a saturated solution of sulphate of magnesium with glucose—had been offered in the market, Prof. P. W. Bedford has made diligent search for such an article, but has been unable to find such. He concludes that the statement may be safely shelved as a non-authenticated newspaper article; such a fraud being the more unlikely, since the simplest tests serve to detect it.—Proc. N. Y. St. Phar. Assoc., 1888, 185.

Nitro-Glycerin—Security from Explosion of its Solution within Certain Limits.—A 10 per cent. solution of nitro-glycerin being kept in stock for convenience in making dilutions, the editors of the "American Druggist" applied to Prof. Charles E. Munroe, at the Torpedo Station, Newport, R. I., who is recognized as the foremost expert on high explosives in this country, for information respecting the possible danger of the explosion of solutions of such strength. The reply elicited may be summed up as follows:

1. A 10 per cent. alcoholic solution of nitro-glycerin is *absolutely non-explosive.*

2. If a 10 per cent. alcoholic solution should be spilled by breakage or otherwise, the absorbent substance, after the evaporation of the alcohol, *would certainly become dangerous*, but the relative danger would depend upon the relative proportion of absorbent and nitro-glycerin, as well as upon the character of the absorbent. Thus a mixture of not more than 70 parts of nitro-glycerin with 30 parts of infusorial earth, or charcoal, or saw dust, *would be non-explosive*, except by the action of a so-called detonator. A mixture containing not more than 52 per cent. of nitroglycerin and 48 per cent. of the above named substance, would be absolutely non-explosive even by the action of a detonator. But if the absorbent material should be an oxidizing substance, such as a nitrate, a chlorate, etc., then *even so small a proportion as 5 per cent. of nitroglycerin may render the combination explosive.*

For this reason, alcoholic solutions of nitroglycerin should always be kept and transported in vessels which are not liable to fracture; the most suitable being tin cans, such as ether is put up in.

3. In case any solution of nitroglycerin, or the latter in a pure state, has been spilled, Prof. Munroe advises to render it innocuous by applying a solution of sulpho-carbonate of sodium, prepared by dissolving sublimed sulphur in a solution of sodium carbonate, by the aid of heat. The spilled nitroglycerin solution should be wiped up as carefully as possible with a cloth, and this, together with the place or absorbent material which has soaked it up, should be thoroughly drenched with the "sulphur solution."—Amer. Drugg., Feb. 1888, 35.

FIXED OILS.

Oleic Acid—Solid Isomeric Compound.—Mr. Saytseff describes a solid isomer of oleic acid, which he has obtained, together with ordinary oleic acid, by treating with alcoholic potash the iodostearic acid obtained by the action of hydriodic acid upon ordinary oleic acid. The same compound is formed during the distillation of oxystearic acid, produced by the successive action of sulphuric acid and water upon ordinary oleic acid. The solid oleic acid (isoleic acid) is described as being insoluble in water, freely soluble in alcohol and in ether, and melting at 44°–45° C.—Pharm. Jour. and Trans., June 2, 1888, 1006; from Jour. f. Prakt. Chem., xxxvii., 269.

Solvin (*Polysolve*)—*Therapeutic Value.*—Mr. R. Kobert has instituted some experiments to determine the value and therapeutic effects of solvin or polysolve (see *sulpholeates*—Proceedings 1886, 57), a product of the action of sulphuric acid upon ricinus oil. The active component of this substance is most probably the sulphuric acid ether of ricinolic acid neutralized either with soda or ammonia. Mixtures of solvin and water permeate animal and vegetable membranes very readily, and increase at the same time the diffusibility of the substances dissolved in them. It is recommended by W. Kirchmann, the owner of the German patent, as a non-irritant and superior addition to medicaments for external use, and even for enemas. The experiments of Mr. Kobert, however, prove that ricinol sulphuric ether, even when neutralized, destroys the red blood corpuscles in defebrinated blood, even when present in the amount of 1:15,000. Its action upon frogs and warm-blooded animals is that of a general poison, comparable to that of the substances belonging to the saponin group. It is evident, therefore, that solvin must be admitted as a medicament only with great caution.—Chem. Repert. (Chem. Ztg.), Jan. 22, 1888, 23; from Therap. Monatsh., 1887.

Iodol—Solubility in Volatile Oils, which see.

Iodol—Poisonous Effect.—Dr. Pallin gives an account of a case of necrosis of the clavicle in which an operation was performed, and seventy-five grains of iodol were applied to the wound. During the evening of the same day the patient became delirious, and on the following day his temperature was 102.2° F., his pulse was 136, small and irregular, and he vomited and was apathetic. The urine showed traces of albumen and a weak iodine reaction. Although the dressing was changed at once, all the iodol being washed out of the wound and bismuth applied in its place, the symptoms of poisoning lasted four days longer, and for a fortnight iodine was to be recognized in the urine.—Am. Jour. Pharm., Jan. 1888, 8; from N. Y. Med. Jour.

Iodol and Iodoform—Comparative Action.—Mr. Robinsohn has made comparative experiments with iodol and iodoform. Judging from the observation that when iodol is used iodine may be found in the urine for a considerable time, Mr. Robinsohn concludes that the absorption of iodol is very slow and gradual, being only in proportion to the gradual separation of iodine; that, in fact, the iodol is not absorbed at all as such. In large doses iodol is doubtless poisonous, but apparently less so than iodoform. The antiseptic action of iodol is small, and below that of iodoform. It does not interfere with the artificial digestion of albuminoids.—Pharm. Jour. and Trans., Oct. 1, 1887, 279; from Chem. Ztg., Sept. 18, 1887, 222.

Fixed Oils—Behavior with Polarized Light.—Mr. Bishop shows that, with the exception of oil of poppy seed, the behavior of the fixed oils with polarized light is sufficiently marked to be of practical use. He employed a Laurent's saccharimeter and a tube length of 20 cm., temperature 13° to 15° C., obtaining the following results:

Sweet almond oil, left	0.7°
Arachis oil, left	0.4°
Rape seed oil, left	1.6° to 2.1°
Flaxseed oil, left	0.3°
Nut oil, left	0.3°
Olive oil, right	0.6°
Sesame oil, according to age, right	3.1° to 9°

—Drugg. Circ., Jan. 1888, 9; from Zeitschr. Oest. Apoth. Ver.

Fats and Waxes—Methods of Determining Melting Points.—Mr. T. W. Brick has experimented with different methods proposed for determining the melting points of wax and fats. He finds the method of Prof. Remsen ("Chemistry of Carbon Compounds," p. 8), to be the best method for ordinary use. A glass tube 5 or 6 mm. in diameter is drawn out at one end and broken off so as to leave a small aperture. This narrowed part of the tube is filled with the substance to be tested, and immersed together with a thermometer in a beaker of water, the temperature of which is gradually raised until fusion of the substance takes place, which is shown by the rising of water in the tube. The temperature is observed at the moment when this takes place. Other methods were experimented with, the details of the experiments being given in Pharm. Era, Feb. 1888, 45, 46.

Drying Oils—Oxidation.—Messrs. Bauer and Hazura state that the oxidation of drying oils and oleic acid depends not only upon the addition of oxygen, analogous to the addition of a halogen, but that there occurs a re-arrangement of the oxygen. The oxidation is said to proceed more rapidly in proportion as the quantity of linoleic acid preponderates over the isolinoleic acid. The authors further state that the oxidation of thin layers of drying oils commences with the glycerin of the olein, palmitin and myristicin, by which the respective fat acids are set free.—Pharm. Jour. and Trans., June 2, 1888, 1006; from Chem. Ztg., May 27, 1888, 710.

Linseed Oil—Manufacture.—Mr. James C. Duff has read a comprehensive paper on the manufacture, characters, etc., of linseed oil before the Chicago Chemical Society (Oct. 15, 1887), which is reprinted in West. Drugg., Jan. 1888, 11–12.

Linseed Oil—Characters of Oil Obtained by Solvents, etc.—Mr. F. X. Moerk has extracted linseed oil from the seed by the solvent action of light petroleum ether (b. p. below 45° C.), and of bisulphide of carbon. The oils obtained by the two solvents were identical in all respects, except that the one obtained by bisulphide of carbon was yellowish-brown, while that obtained by light petroleum ether was greenish-brown. The amount of oil yielded was 33.50 per cent. by the first named solvent, and 33.80 per cent. by the petroleum ether from the same sample of linseed. The oil had a slight acid reaction, which is imparted to water on shaking, and a pleasant sweet taste. It is completely soluble in small quantities of carbon disulphide. In absolute alcohol it not only dissolves in five parts by weight, but mixes in all proportions. With an equal volume of 95 per cent. alcohol it forms a clear solution ; on adding more it still remains clear until two volumes have been added, when it becomes turbid, and most of the oil separates on standing. The variability of commercial oil, in regard to solubility in absolute alcohol, has been attributed to the supposed fact that the oil differed in composition when expressed in the cold or with the aid of heat. The author's experiments tend to disprove the correctness of this view : the probable cause being the action of sulphuric acid, to which the expressed oil is subjected with the view to bleaching it. The author contemplates to make further investigations to establish the character of the acid to which is due the ability of the oil to enter into direct saponification with alkalies.—Am. Jour. Pharm., Dec. 1887, 601–604.

Linseed Oil—Examination of Commercial Samples.—Mr. Reinhold C. Werner examined six samples of linseed oil, No. 1 having been prepared by means of benzin, with the following results :

	Sp. gr.	Soluble in abs. alcohol.	Color with $ZnCl_2$	Effect of nitric acid.
1	.930	4.98 parts	Green	Red-brown and effervescence.
2	.928	5.00 "	Greenish-yellow	" " "
3	.930	5.20 "	" "	Dark " " "
4	.930	5.30 "	" "	Dirty " " " with heat.
5	.930	5.10 "	" "	Reddish " " " "
6	.929	5.15 "	Yellowish-green	Red-brown " " "

—Amer. Jour. Phar., Dec. 1887, 610.

Cotton-Seed Oil—Manufacture, Qualities and Uses.—In reply to a query respecting the statistics of the manufacture and uses of cotton-seed oil, Mr. J. W. Thomas, Jr., contributed a highly interesting paper at the recent meeting of the Virginia Pharmaceutical Association. While in 1867 there were only seven cotton oil mills in the United States, in 1880, according to the Tenth Census Report, there were forty-five, producing products valued at over seven and half million dollars. Large quantities of the oil, as well as of the seed, are exported, and there is little doubt that the oil is used to falsify or entirely substitute olive oil. The author's remarks respecting the manufacture of the oil, being based upon careful and extensive inquiries, may find place here: "The seed when landed at the mill is first examined. If too damp or wet it is dried by spreading it over a floor with free access of air, exposing it on frames to the sunlight in warm weather, or by kiln-drying. Drying is the exception rather than the rule in the United States. Cotton-ginning is so carefully done that the seeds have little or no opportunity to get wet. Besides this, the seed is generally held at the gins for some time before it is sold to the oil manufacturer. The first process in preparing the dry seed for the mill is to free it from dust. This is effected by shaking it in a screen or in drums lined with a fine metallic net and containing a strong magnet, to which any iron nails will adhere, which are frequently present. From the drums the seeds drop into a gutter leading to a machine which removes the lint left by the gin. This is done by a gin constructed for the purpose, with saws closer together than the ordinary gin. An average of twenty-two pounds of short lint is taken from a ton of the seed. This product, called "linters," is used in the manufacture of cotton batting. The clean seeds are then transferred to the sheller, which consists of a revolving cylinder containing twenty-four cylindrical knives and four back knives. The sheller revolves at great speed, and as the seed is forced between the knives the pericarp or hull is broken and forced from the kernel. The mixed shells and kernels are separated in a winnowing machine by a strong blast of air. This removal of the husk makes a vast difference in the meal cake, a desiccated or decorticated cake being five times more nutritious and wholesome than an undecorticated cake. Being thus cleaned, shelled and separated, the kernels are carried by a system of elevators to the upper story and then pass down into the crusher rolls to the ground floor. Cold pressure produces a good salad oil, and this is the method generally pursued in Marseilles and other European cities for the first pressure, after which the residue is subjected to a second warm pressure. In this country, however, warm pressure is generally preferred. The meal is heated in a meal heater for fifteen or twenty minutes to 204.4° to 215.3° F. The heated meal is placed in woolen bags, each holding sufficient seed for a cake. The bags are then placed between horse-hair mats backed with leather having a fluted surface inside to facilitate the escape of the oil under the hydraulic pressure amounting to 169 tons. With the most improved presses the hair mats are, however, done away with. The bags remain in the press seventeen minutes, the solid "oil cake" of commerce remaining behind. This cake forms a superior feed for cattle, horses, sheep, and especially swine, and is nutritious, easily digested, and fattening.

"Cotton-seed cake" is of a rich golden color, quite dry, and has a sweet, nutty, oleaginous taste. When ground to the fineness of corn meal it is known as "cotton-seed meal," and in that form is frequently used for fertilizing purposes.

Four qualities of oil are known: *Crude oil* is thickly fluid and of a dirty yellowish to reddish color; on standing, it deposits a slimy sediment. The *second* quality has a pale orange color and is obtained by refining the crude oil. The *third* quality is obtained by further purification of the second; and the *fourth* quality, which has a pale straw color and a pure nutty taste, is obtained by bleaching the third quality.

As regards the usefulness of cotton-seed oil, the author considers it important both as an article of food—outrivalling the famous "Lucca Salad Oil"—in the arts, and as a substitute for other oils in pharmacy. Pharmaceutically it has the advantage over the more expensive almond and olive oils, in that it will not become rancid, remaining always a bland liquid ready and convenient for use, and supplying their place for most purposes. As an article of food, it will answer for lard or butter for frying purposes, but it will not do to eat on bread or in pastry.—Proc. Virg. Pharm. Assoc., 1888, 66–73.

Cotton-seed Oil—Characteristic Reaction.—When cotton-seed oil is treated with subacetate of lead and a caustic alkali, it gives, almost immediately, an orange-red reaction. Mr. Labiche claims that this reaction is peculiar to cotton-seed oil, for almond, castor, olive, poppy, rape and cod-liver oils give a milky mixture, which is also the case with butter when thus treated. Mr. Labiche mixes equal parts of the oil and a saturated solution of neutral acetate of lead, and adds ammonia, stirring briskly. The acetate decomposes and the nascent oxide reacts upon the oil. Then the red color appears. After standing, the surface turns orange-red and the lower portion becomes grumous. If 20 per cent. of cotton-seed oil be present, the coloration appears at once; lesser quantities show on the surface after the mixture has remained standing for a time.—L'Union Ph., Nov. 1887.

Olive Oil—Adulterations.—Mr. John Franklin Hildebrand reviews the various tests recommended for the determination of adulterants in olive oil. His direct experiments refer particularly to Buch's method of testing olive oil with nitric acid: 5 c.c. of the sample are shaken in a convenient tube with 5 c.c. of nitric acid, sp. gr. 1.30, for one minute and the resulting color observed, after one minute; after five minutes in boiling water; and the consistence noted after standing from 12 to 18 hours at about 60° F.

		COLOR.		CONSISTENCY.
Pure		1 Min.	5 Min.	
Olive	Oil	Pale Green	Orange-Yellow	Solid.
Cotton Seed	"	Yel.-Brown	Reddish-Yellow	Smeary.
Sesame	"	White	Brownish-Yellow	Liquid.
Peanut	"	Pale Rose	" "	Solid.
Rapeseed	"	" "	Orange-Yellow	Solid.
Ricinus	"	" "	Golden-Yellow	Smeary.

Mixtures of olive oil with small amounts of cotton-seed and sesame oil are distinguished by the entire mass, though at first *more darkly colored* and solidifying like pure olive oil, yielding, after 24 to 36 hours, a brown oil upon the surface of the solidified mass, whilst the lower layer shows the yellow color of the pure olive oil.

Oils which have been treated with alkalies show the same reactions as the pure oils. The melting and solidifying points of olive oil are so far from those of the other oils that adulteration with them, to the extent usually occurring in commerce, can be readily detected by noting the melting and solidifying points.

Simple tests for the most common adulterants, viz., linseed, cotton-seed, rape, and sesame oil, are also given.—Amer. Jour. Pharm., 437–439.

Olive Oil—Methods for Determining the Presence of Cotton Oil and Sesame Oil.—Mr. Ernest Millian has applied Becchi's test for determining cotton oil in olive oil (see Proceedings 1887, 281)—based upon the reducing action of cotton oil upon argentic nitrate, but he finds that some varieties of the pure olive oil give a slight reduction, owing to certain causes which he points out. If, however, the fatty acids be first separated and the test be then applied to them, the acids from pure olive oil give no reduction, while those from cotton oil always reduce the silver. On this assumption he has based the following process: Place 15 c.c. of the oil into a porcelain basin and warm it up to 110° C. Make a mixture of 15 c.c. of a solution of sodium hydrate (40 degrees Baumé) with 15 c.c. of alcohol of 92 degrees, and add this solution very gradually to the heated oil, taking care that the temperature is maintained during the process. When a homogeneous mass has been obtained, distilled water is added drop by drop, so as not to cool the paste or to form clots, and this is continued until 500 c.c. of water have been introduced. The whole having been boiled for a few minutes, dilute sulphuric acid (1 in 10) is added, so as to produce a slight excess of acidity, and the fatty acids are thus obtained floating on the surface. The author does not seem to consider it necessary to wash these acids, but he simply removes about 5 c.c. by means of a silver spoon, and puts this amount of the separated acids into a test tube with 20 c.c. of alcohol, and warms until dissolved. To this liquid he adds 2 c.c. of a 30 per cent. solution of argentic nitrate, and heats the whole on the water-bath until about one-third of the fluid is evaporated off, when the test is complete. If the olive oil be pure, the fatty acids remain unaltered, but if cotton oil be present, the acids float to the surface as a black paste. By this method the author has easily detected a one per cent. adulteration.

To recognize the presence of sesame oil in olive oil, the author finds that Baudouin's reagent is the best, but here also a pure oil may be unjustly condemned when working on the oil itself. If, however, the separation of the fatty acids be first carried out, the results are accurate. In this case, after saponification and separation of the acids, they must be perfectly dried at 110° C. They are then put into a tube and shaken up with Baudouin's reagent (hydrochloric acid and sugar), when the characteristic red color will be produced.—Amer. Jour. Pharm., June 1888, 290; from Arch. de Pharm., through "The Analyst," May 1888, 95.

Castor Oil—Occurrence of Two Distinct Fatty Acids.—Messrs. Hazura and Grüssner find that the peculiar liquid fatty acid of castor oil yields upon oxidation, besides trioxystearic acid, melting at 140°–142° C. an isotrioxystearic acid, melting at 110° to 111° C., but no dioxystearic acid. They consider, therefore, the liquid fatty acid of castor oil to be not a homogeneous body, but a mixture of two isomeric acids, having the formula $C_{18}H_{34}O_2$—one of which,

Ricinoleic Acid, yields upon oxidation the trioxystearic acid, while the other,

Ricinisoleic Acid, yields isotrioxystearic acid.—Pharm. Jour. and Trans., June 2, 1888, 1006; from Chem. Ztg., May 27, 1888, 710.

Castor Oil—Test for Other Fixed Oils in Admixture.—Mr. Finkener communicates the following test for adulterants in castor oil: Pure castor oil agitated with 5 volumes alcohol sp. gr. 0.829, at normal temperature (15° C.), forms a clear solution, but if the suspected oil contains only 10 per cent. of other fat oils, as olive, sesame, rape, cotton, or linseed oil, the solution becomes turbid and does not clear at 20° C., the undissolved oil settling to the bottom.—Pharm. Centralhalle, 1887, p. 294.

Oil of Jatropha Curcas—Characters.—It is stated that the oil from the seed of *Jatropha curcas,* which under the name of

"*Oleum Ricini Majoris*" or "*Oleum Infernale*" was formerly used in medicine, is now being imported into Portugal for material as a burning oil, for soap making, and as an adulterant of olive oil. Mr. Horn examined a genuine sample, obtained by pressing the seeds in the cold, and describes it as having a faint yellowish color, a slight peculiar odor, a density of 0.9192 at 15° C., and almost insoluble in alcohol. At the temperature of 90° C. it began to separate white flocks of stearin, etc., and at 0° C. it was perfectly solid.—Pharm. Jour. and Trans., June 2, 1888, 1006; from Zeitsch. Analyt. Chem., xxvii., 163.

Ground-Nut Oil—Character of Fatty Acids.—Some differences occur in the statements in the text-books as to the fatty acids present as glycerides in ground-nut oil (*Arachis hypogæa*). Watts gives them as palmitic, arachic and hypogæic acid. In the "Pharmacographia" it is stated that its principal constituent is stated to be oleic acid, accompanied by hypogæic, arachic and palmitic acids. Messrs. Schoen and Kreiling have now made experiments with oil expressed specially from African seeds and with warranted commercial specimens. Mr. Schoen failed to separate any substance corresponding to the published description of hypogæic acid, and came to the conclusion that ordinary oleic acid is the only acid of the $C_nH_{2n-2}O_2$ series present in the ground-nut oil. Mr. Kreiling, besides separating arachic acid, obtained another acid of the same series, which he identified with "lignocerinic acid" ($C_{24}H_{48}O_2$), discovered by Messrs. Hell and Hermann in 1880 in beechwood tar, but not previously observed in ground-nut oil. While he failed to separate palmitic acid, he does not consider his experience to be conclusive of its absence.—Phar. Jour. and Trans., April 28, 1888, 902; from Ber. d. D. Chem. Ges., xxi., 878 and 880.

Cacao Butter—Examination.—Mr. Edgar J. Millard gives the results of the examination of commercial samples of cacao butter. He finds the test of the British Pharmacopœia—which lays stress upon the melting point—to be misleading, since cacao butter containing certain proportions of paraffin, wax, or tallow were found to vary but slightly outside the limits given as "usual" in that standard. The test of the U. S. Pharm., which consists in the solution of the fat in 4 parts of ether at 17° C. and cooling to 0° C. whereby the clear solution should not become turbid before three minutes, he considers far more satisfactory. The results of the author's examination of eighteen samples prove the article of commerce to be in the main satisfactory.—Yearbook of Pharm., 1887, 556–559.

Woolfat—Ancient Uses.—Dr. G. Vulpius contributes an interesting historical sketch of woolfat, which has recently again found a place in medicine through the endeavors of Liebreich and others, though, as a matter of fact, it must be regarded a very ancient remedial agent. It was known under the name of "Œsypus," and is mentioned by Pliny and by Dioscorides, the former describing the method of its preparation, preservation and uses, which seem to have been confined to the treatment of eye affections; while in the "Comentarii in libros sex Pedacii Dioscoridis de Materia Medica" of Mathioli, which appeared in 1554 in Venice, a somewhat more extended account both of the method of its preparation and uses is given. Œsypus is, furthermore, mentioned and described in the "Dispensarium Usuale pro Pharmacopolis," known under the name of the "Cologne Pharmacopœia," in 1568; in "Johann Schroedrer's Pharmacopœia Medicochymica," ed. 1641, and in the "Pharmacopœia Augustana Renovata" of 1694. From the end of the 17th century to the middle of the present the woolfat appears to have been completely lost sight of, the only mention of it up to very recent times having been made by Chevreul in 1856, when speaking of the composition of the cholesterin compounds, and in 1858 by Berthelot, when mentioning the occurrence of the latter. In 1867 it is mentioned by Vohl in his paper on the "Separation and utilization of the fats from the soap waters of the cloth and woolen factories," and again in 1869–

1870 by Hartmann, E. Schulze, and F. Fischer. The most remarkable observation in connection with its ancient uses is that then as now the woolfat was not used in its pure condition, but always in admixture with more or less water.—Arch. d. Phar., June 1, 1888, 489–495.

Lanolin—Antiseptic Power.—Dr. Gottstein concludes from his observations that no bacteria of any kind can be grown on or in lanolin. Fränkel had already stated that lanolin is free from germs, not only when prepared, but also in the raw condition of woolfat, and Gottstein has proved its antiseptic character by direct experiment. Certain kinds of bacteria connected with putrefaction perish in glycerin fats also, and this is owing to two causes: First, because the fatty acids set free are hostile to bacteria; and secondly, because most germs found in the air are aërobiotic, that is, they require a fitting nutrition basis, the oxygen of the air, for their development. The air, however, contains also anaërobiotic germs, and it can be shown by experiment that sterilized (ordinary) fat after it has been exposed for a few days, and has undergone the usual changes (a yellowish appearance and rancid odor,) contains anaërobiotic germs in its interior. This is one of the chief distinctions between lanolin and ordinary fats, for such germs are not found in and cannot develop in lanolin. The author thinks that therapeutically speaking, lanolin has a great future before it. Its miscibility with water in any proportion, its ready absorbability by the skin, its freedom from any tendency to rancidity, as confirmed and explained by the above experiments, constitute it the vehicle par excellence for cutaneous medicaments. The author does not seem to have considered in this connection the recent experiments of Ritter, which go to show that in the absorption experiments hitherto made, salicylic acid was a powerful factor.—Drugg. Circ., Febr. 1888, 33; from Berl. Klin. Wochenschr.

Lanolin—Superiority of Lard.—Experiments made with a view of determining the relative value of lanolin in promoting absorption through the skin have been reported upon by Dr. Guttman in the *Med. Chron.*, potassium iodide and salicylic acid being used, as being readily detected in the urine. Ointments of equal strength, made with lanolin and with lard, were used upon four different patients, and, in the subsequent examination of the urine, the most frequent and distinct indications of the absorption of the iodide or of salicylic acid were found after the use of the lard ointment. At any rate, the results are considered to prove, at least, that lanolin possesses no superiority over lard in promoting the absorption of potassium iodide or salicylic acid through the skin.—Amer. Jour. Pharm., Oct. 1887, 492; from Amer. Pract. and News.

Lanolin—Preparation of Emulsion.—Mr. Hoefte states that lanolin is now sometimes ordered as an emulsion. In dispensing such a prescription he recommends that the lanolin be first rendered anhydrous by prolonged heating, then weighed and rubbed up with half its weight of powdered gum arabic, and finally with the necessary quantity of water. —Pharm. Jour. and Trans., Aug. 27, 1887, 172; from Zeitschr. Œst. Apoth. Ver., 1887, 305.

Lard—Commercial Quality.—Mr. Norman G. Ritter prepared lard according to the Pharmacopœia from the internal fat (the leaves), the loss from the weight of the crude fat being 7.5 per cent. Comparing this fat (No. 1 of the table) with a number of commercial samples, he obtained the following results:

No.	Melting at	Clear at	Water present.	Salts present.
1	88° F.	95° F.	———	Traces KCl and NaCl.
2	86° F.	93° F.	9.5 per cent.	0.75 per cent. KCl, NaCl.
3	86° F.	93° F.	———	Traces of chlorides.
4	82° F.	92° F.	.2 per cent.	0.75 per cent. chlorides and carbonates.
5	86° F.	93° F.	1.75 per cent.	0.5 per cent. chlorides
6	86° F.	93° F.	2.0 per cent.	0.5 per cent. chlorides
7	86° F.	93° F.	3.0 per cent.	0.5 per cent. carbonates.
8	82° F.	92° F.	4.5 per cent.	Traces of chlorides.
9	82° F.	92° F.	———	0.5 pr. ct. chlorides with trace of alum.
10	82° F.	92° F.	0.5 per cent.	0.5 per cent. carbonates.
11	82° F.	92° F.	7.0 per cent.	0.5 per cent. chlorides.

Aside from the water and salts found in most, the commercial specimens consisted either entirely of the external fat, or of mixtures of the internal and external fat, as indicated by their melting points. The cost of the lard, rendered by the author, was from 10 to 16 per cent. less than that of the samples examined.—Amer. Jour. Pharm., Jan. 1888, 10.

Lard—Convenient Method of Dehydration.—In order to deprive lard or other fatty substances of accompanying water, it is recommended in "Polyt. Centralbl." to add to the melted lard a sufficient quantity of effloresced and dried sulphate of sodium (or dry chloride of magnesium if this can be readily obtained). The salt will combine with the water and form an aqueous layer at the bottom.—Amer. Drugg., June 1888, 115.

Butter—New Process of Examination.—Dr. Röse describes a process for the examination of butter based upon the determination of the fatty acids that are soluble in water. He states that whilst from 5.7 to 9.7 per cent. of the fatty acids of butter fat are soluble in dilute (10 per cent.) alcohol, only from 4 to 5.1 per cent. are soluble in water at 15° C.; and further, that the melted fat is easily saponified at the ordinary temperature if the alcoholic potash be of a certain concentration and made with absolute alcohol. The reagents used are a solution of 120 grams of caustic potash in a litre of absolute alcohol, and dilute sulphuric acid containing about 20 grams of SO_3 to the litre. 12.5 grams of the filtered butter fat is weighed into a flask marked for half a litre, 50 c.c of potash solution added, and the flask stoppered and swung to and fro for five minutes, at the end of which the saponification is complete. A slight excess of sulphuric acid is then run in; the mixture is diluted after a minute or two with water to about 490 c.c., the froth broken up by the addition of 5 c.c. of alcohol, and water is added sufficient to fill up to the mark, and in addition a quantity equal to the fat operated upon. After being shaken the whole is filtered through a dry filter, and then 200 c.c. of the filtrate is titrated with $\frac{1}{10}$ normal potash solution, using phenolphthalein as indicator. A blank experiment is carried out at the same time, and the difference between the two results gives the quantity of readily soluble fatty acids present.—Pharm. Jour. and Trans., June 2, 1888, 1006; from Pharm. Ztg., May 26, 1888, 310.

CARBOHYDRATES.

Cellulose—Use for Finings.—Cellulose, in the form of paper and wood pulp, is now being extensively employed in Europe for the clarifying or "fining" of beer, wines, syrups, and pharmaceutical extracts. The addition of a little salicylic acid to the pulp, which does not seem to interfere with its use, enables it to be kept in the flocculent or damp state without fear of decomposition.—Amer. Drugg., Jan. 1888, 7.

Paper—Ancient Materials Used in its Manufacture.—It has been generally believed that linen rags have been used in the manufacture of paper only since the fourteenth century, and that previously to that the writing materials of the East were chiefly made from unmanufactured materials. This view must be considerably modified in consequence of a careful microscopical examination made by Dr. Julius Wiesner, of the paper from El-Faijûm preserved in the Austrian Museum at Vienna, in the collection known as "Papyrus Erzherzog Rainer." Many of these papers extend to the ninth, and some are even as old as the eighth century. The papers are all "clayed" like modern papers. Dr. Wiesner's examination gave the unexpected result that these papers were all manufactured from rags. The fibre is mainly linen, among which are traces of cotton, hemp, and of some animal fibre; well-preserved yarn threads are of very frequent occurrence. The manufacture of paper out of rags is not, therefore, as has hitherto been supposed, either a German or an Italian invention, but is an Eastern one. In addition to the Faijûm papers, he examined also more than five hundred Oriental and Eastern specimens from the ninth to the fifteenth century, not a single one of which was a raw-cotton paper; all were manufactured from rags, the chief ingredient being linen. The examination of the substance used for "claying" gave equally unexpected results. In all the Faijûm papers this was found to be starch-paste, a substance which had been supposed not to have been used for this purpose before the present century; animal substances do not appear to have been employed for "claying" before the fourteenth or fifteenth century. In some instances well-preserved starch-grains were mingled with the paste; these agreed, in form and size of the grains, with wheat starch, and were evidently prepared starch separated from the meal. In two papers, belonging to the tenth and eleventh centuries, buckwheat-starch was found, and the cultivation of this substance must, therefore, be dated back to the tenth century. The object of the "claying" was apparently to increase the whiteness of the paper.—Phar. Jour. and Trans., April 14, 1888, 864.

Photoxylin—A Substitute for Gun Cotton.—Professor Wahl draws attention to a substance used by Russian photographers as a substitute for gun cotton in collodion, and recommends the collodion prepared from it in surgical practice. He states that a five per cent. solution of photoxylin in equal parts of alcohol and ether, when applied to the skin, forms an impervious dressing that adheres firmly, and is not easily rubbed off in washing.—Amer. Drugg., Sept. 1887, 174; from Pharm Jour. and Trans.

In a subsequent number of the Amer. Drugg. (Oct., 1887, 198), it is stated that the name "photoxylin" is applied to pyroxylin, made from a very superior kind of wood-pulp, and that it furnishes a collodion of very superior cohesive power. It has been introduced in commerce under the name of "Mann's Collodiumwolle."

In the November number of the Am. Drugg. (p. 217) the statement is made on the authority of Dr. P. Ch. Elmer that Mann prepares his pyroxylin with sulphuric acid of but moderate strength. He takes 31 p. of sulphuric acid of 1.830–1.835 s. g., 20 p. nitrate of potassium, and immerses the cotton (wood-pulp ? Rep.) in the mixture when at 50° C., digesting it 24 hours at 28°–31° C. The time of digestion can be extended to 5 or 6 days, but an hour will suffice if the temperature of 50° C. is maintained. Nitrate of sodium will not do, because it crystallizes easily from the mixture.

Photoxylin—Preparation.—Mr. Geo. M. Beringer has experimented to determine a suitable formula for making nitro-cellulose from wood-pulp. The latter was supplied him both in the loose fibrous form and in the shape of sheets, rolled under reduced pressure so as to leave them thick and porous. These samples of wood-pulp were carefully dried. Several processes of nitrating were tried with mixtures of nitric and sulphuric acids, and also with potassium nitrate and sulphuric acid. The following process, a modification of a formula used for collodion cotton, gave good results and was adopted:

Nitrous acid, 43° Baume	3½	lb. av.
Sulphuric acid	4½	lb. av.
Potassium nitrate, granular	8	oz. av.
Wood pulp	4	oz. av.

The nitrous and sulphuric acids are mixed in an earthenware crock and allowed to stand until the temperature has fallen to 90° F., when the potassium nitrate is added and thoroughly incorporated with the acid mixture; the wood pulp is then immediately immersed in the mixture and allowed to remain for 12 hours. It is then removed from the acid and thoroughly washed. A few drops of ammonia water added to the wash-water greatly facilitates the thorough washing and removal of the acid. The nitro-cellulose thus prepared leaves little or no residue on burning, and is entirely soluble in a mixture of 50 per cent. concentrated ether and 50 per cent. alcohol. The author finds 3 per cent. solution thick enough, and that it leaves a very tough film; while 5 drops of castor oil to the fluid ounce renders it flexible.—Amer. Jour. Pharm., May 1888, 225-226.

Starch—New Method of Estimation.—Mr. Asboth proposes a new method for the estimation of starch, which is founded on the fact that starch, after boiling, forms a definite insoluble compound with baryta. The substance, in fine powder, is triturated with water, and heated with frequent stirring on the water-bath half an hour; the quantity of material taken being such that not more than half of one per cent. of starch is in the resulting mixture. To 150 c.c. of the cool mixture 50 c.c. of baryta water are added, the flask is corked, shaken well during two minutes, alcohol of 45 per cent. is added to make the volume exactly 250 c.c., and the mixture is set by for a few minutes. To 50 c.c. of the upper clear stratum of fluid, some phenolphthalein is added, and it is then titrated with decinormal hydrochloric acid; the same experiment being made with 10 c.c. of the baryta water used. The difference gives the amount of baryta in one-fifth of the material taken for the analysis, and the quantity of starch contained in this is found by multiplying this difference by 0.158.—Pharm. Era, Nov. 1887, 408, 409; from Rep. f. Anal. Chem., 1887, 299.

Starch—Estimation in Presence of Dextrin—Dr. G. Burkhard says starch may be detected and estimated in the presence of dextrin as follows: To the solution add alcohol gradually with constant stirring until a slight turbidity is produced; warm the mixture until it becomes clear, then add solution of tannic acid, by which the starch will be precipitated. Collect the precipitate on a filter and wash with alcohol. Starch may be now identified by the iodine test, applied after the alcohol is evaporated from the filter, or the estimation may be made quantitative by treating the precipitate on the filter with dilute sulphuric acid to convert the starch into glucose, and titrating with Fehling's solution—Phar. Era, Dec. 1887, 446; from Chem. Ztg., 1887, 1158.

Iodide of Starch—Analogy to Iodocholic Acid (which see).—Mr. F. Mylius observes that the analogy between iodide of starch and iodocholic acid is shown by the following facts: (1) Iodine solutions which color starch contain either hydriodic acid or one of its salts. (2) The presence of substances, such as chlorine, which decompose hydriodic acid, prevents the formation of iodide of starch. (3) Silver solutions decolorize solution of iodide of starch—the color is restored by adding potassium or hydrogen iodide. (4) An aqueous solution of iodine cannot color starch blue; the blue color appears at once when a trace of hydriodic acid or potassium iodide is added.

When starch is added to a solution of iodine and hydriodic acid containing sulphuric acid, iodide of starch separates: the amount of iodine and hydriodic acid which has been absorbed by the starch can be readily determined by titration. The results of several experiments show that the proportion of iodine absorbed to that of the hydriodic acid is 4 : 1, and it is probable that the resulting compound has the formula $(C_{24}H_{40}O_{20}I)_4$. HI. From this, the author concludes that the formula of starch is $C_{24}H_{40}O_{20}$, which is that ascribed to it by Pfeiffer and Tollens (1882).

Iodide of starch dried in a vacuum appears to be anhydrous. The *barium compound* was analyzed, and has probably the composition expressed by the formula $(C_{24}H_{40}O_{20}I)_2$. BaI_2. The *potassium* and *sodium compounds* are soluble, the *barium* and *zinc compounds* are insoluble.—Ber. der D. Chem. Ges., xx. 688–695; from Jour. Chem. Soc., 1887, 568.

Iodide of Starch—Composition and Method for Determining Starch.—Mr. F. Seifert has re-determined the composition of iodide of starch, and finds it to be $(C_{24}H_{40}O_{20})_6\ I_7$, and not, as given by Mylius, $HI(C_{24}H_{40}O_{20}I)_4$. The method pursued by the author in determining the composition of iodide of starch has led him to another, whereby the quantity of starch in a substance may be rapidly determined. 1 gram of starch is mixed with 100–150 c.c. of hot water in a flask, and heated at the boiling temperature of a water-bath with frequent agitation for two hours. The mixture is rinsed into a flask of 500 c.c. capacity, 50 c.c. of a solution of iodine, containing 12–13 grams of iodine, and as small a quantity as possible of iodide of potassium per litre is added, followed by 20 c.c. conc. hydrochloric acid, and sufficient water to make 500 c.c. of the mixture. The mixture is well shaken and then allowed to settle, after which the clear solution (50 c.c.) is titrated with hyposulphite of sodium. The loss of iodine sustained by conversion into iodide of starch is then ascertained, and when multiplied by 4.37 gives the amount of starch substance, or by 4.41 the amount of dry starch granules.—Chem. Repert. (Chem. Ztg.), Jan 29, 1888, 31; from Ztschr. f. angew. Chem., 1888, 15.

Inulin.—Conversion into sugar due to a special ferment. See *Inulin Ferment*, under "Albuminoids."

Dextrin.—Presence and detection in *Extracts*, which see under "Pharmacy."

Dextrin—Special Preparation as a Substitute for Gum Arabic.—Mr. Schumann has patented a process (in Germany?—Rep.) for preparing a substitute for gum arabic as an adhesive agent, which is merely dextrin free from sugar. It is prepared in the following manner: Two hundred (200) parts of starch are boiled with 1000 parts of water, and 1 part of sulphuric and nitric acid in a closed boiler, at a pressure of 2 to 3 atmospheres, until the pasty mass begins to become thin fluid. At this moment the boiling is at once stopped, and the acid neutralized. The boiling is recommenced at a pressure of 3 to 5 atmospheres, until the starch is converted into what is technically known as "Gommeline." This consists of dextrin, glucose, cellulose, the salts derived from neutralizing the acid and other substances. The cellulose and salts are separated, the remainder filtered through the bone-black, and the filtrate concentrated, first in a vacuum apparatus, and then in open vessels, to a density of 40° Beaumé. It is put on the market either in this condition as a viscid liquid, or is further concentrated until it is obtained as a solid, forming glassy lumps when broken up. The product is perfectly transparent, not hygroscopic, and is as adhesive as gum arabic.—Amer. Drugg., May 1888, 83.

Irish Moss Gelatin—Value as an Emulsifier.—Mr. John F. Patton has made some experiments with Irish moss gelatin, prepared by the method of Mr. Emlen Painter (see Proceedings 1887, 578), and other emulsifying agents, and finds that the Irish moss gelatin more quickly and easily emulsifies than any other agent used, although he does not think that the globules of the articles emulsified are so minutely emulsified as with acacia. On the other hand, the emulsion made with the Irish moss gelatin is a much nicer mixture, and, only 40 grains being used to the pint, it is very much cheaper than that made with gum arabic.—Proc. Penn. Pharm. Assoc., 1888, 31–32.

Moss-Mucilage — Value as an Emulsifier.—See *Emulsions* under "Pharmacy."

Myrrh-gum—Utility for Paste, etc.—Mr. H. E. Emerson has experimented with myrrh-gum. The residue of myrrh left after the preparation of the tincture was washed with alcohol, and dried, and subsequently dissolved in one, two, and four parts of water. After straining the yellowish opaque mucilage, its adhesive properties were tried and found to be rather superior to gum arabic, since it causes labels to adhere tightly to glass, wood, tin, etc. Though its want of transparency detracts somewhat from its usefulness, it has the advantage of keeping unaltered for a long time.—Amer. Jour. Pharm., July 1887, 334.

Sugar—Clarification of its Solutions for Polarization.—Mr. C. Rytel has used ordinary chalk successfully for the clarification of sugar solutions before polarization. The chalk is well triturated and sifted, then washed with distilled water by decantation, and dried until a meal-like powder remains. If completely dry it does not mix so well with the sugar solution, while in the slightly moist condition it rapidly forms an intimate mixture. About 1 gram is added to the quantity of sugar solution required for polarization, such solution having previously been clarified with sugar of lead, and then filtered.—Chem. Repert. (Chem. Ztg.), Jan. 29, 1888, 30; from Przegl. techn., 1887, 24, 49.

Sugar—Examination for Blue Pigment.—Mr. Charles C. Stratton has examined 17 samples of commercial sugar, all of which were labeled "first grade granulated," the majority of the samples being the products of one refinery. Every one of these sugars was whitened with a blue pigment, the nature of which was not examined except in a few instances, when it proved to be ultramarin. For determining the amount of blue pigment, six pounds of sugar were used of each lot, except a few specially noted below. The sugar was dissolved in pure water; the syrup was set aside for 3 or 4 weeks, and then decanted from the sediment; the residue was diluted with water, mixed with alcohol, and this mixture allowed to settle, decanted and filtered, the undissolved portion being washed upon the filter, dried and weighed. The yield of blue pigment was as follows: 1, 2 grains; 2, 8 grains; 3, 10 grains; 4, 6 grains (mostly dirt, little blue); 5, 6 grains; 6, 5 grains (about one-half dirt); 7, (from 25 oz.) 1¼ grains; 8, 6 grains; 9 (from 25 oz.), ¾ grain; 10, 3 grains; 11, 4 grains; 12, 12½ grains, of which about 4 grains was blue pigment; 13, 5½ grains blue and 5 grains dirt; 14, very little blue; 15, 12½ grains nearly pure blue, largest amount observed; 16, 3½ grains; and 17, 3 grains blue and 2 grains dirt. Since most of the samples came from one factory, it will be seen that the coloring matter used for different lots of sugar by the same maker varies in amount, but is in all cases small and probably not injurious, though it should be considered as an adulterant.

Reference is also made by the author to a paper published in a western journal, stating that the sugars of five refineries in New York and Philadelphia were found to be whitened with ultramarin in three cases, and with Prussian blue in two cases, while the sugar of a Brooklyn refinery had been found free from foreign coloring matter.—Abstract of the Author's Thesis, in Amer. Jour. Pharm., June 1888, 277.

Sugar—Marson's Test for its Presence in Urine.—The following test is given by Marson: Dissolve two grains of ferrous sulphate in about 150 minims of the urine, add 5 grains of caustic potassa and boil. A dark green precipitate forms if sugar is present, and the supernatant liquid is reddish brown or black, according to the amount of sugar. When sugar is absent the precipitate is greenish brown, and the liquid is colorless.—Pharm. Era, May 1888, 177.

Glucose—Commercial Quality in Italy.—Mr. Alessandri has analyzed six samples of glucose of the Italian market, and gives the average of his results as follows: Water, 15.216; chloride of calcium, 6.436; pure glucose, 56.764; foreign organic matter, 21.314; insoluble mineral matter and loss, .270 = 100.000. He suggests that a law be passed compelling the use of sulphuric instead of hydrochloric acid in effecting saccharification.—Boll. Farm.; Répert. de Phar., April, 1888.

Glucose—Action of the Sun's Rays.—Mr. Pasteur draws attention to some recent researches by Mr. Duclaux on the decomposition of sugar by the rays of the sun. This investigator had observed that when an alkaline solution of glucose, either in contact with the air or completely protected from the atmosphere, was exposed to the action of the solar rays, decomposition took place without the intervention of any ferment. Carbonic acid and alcohol were produced in just the same proportion as when sugar is fermented by yeast. This observation, although of no great practical importance, is of considerable scientific interest.—Amer. Jour. Phar., Oct. 1887, 515; from Med. Times, Aug. 1887.

Glucose—Improvement in Fehling's Test.—Mr. Munke observes that when grape sugar is tested for by Fehling's solution, it not unfrequently happens that the separated cuprous oxide remains suspended in the liquid for a long time. The author finds that a rapid precipitation may be brought about by adding to the liquid from 3 to 5 drops of a 15 per cent. solution of chloride of calcium.—Drugg. Circ., March 1888, 59; from Centralbl. f. Med. Wiss.

Sugars of Hesperidin and Naringin—Identity.—See these under "Glucosides."

Quercin—A New Carbohydrate.—Messrs. Vincent and Delachanal have determined a new carbohydrate as occurring along with quercit in acorns, to which they have given the name of quercin. It was obtained in form of transparent hexagonal columnar crystals, which rapidly effloresce in air and become opaque, melt at 340° without change, but begin to decompose above that temperature, and further on show evidence of caramel formation. It is soluble in 60 parts of cold water, much less in boiling water, insoluble in boiling alcohol. It is optically inactive. Its formula, deducted from a hexacetylderivative, is $C_6H_6(HO)_6$. Quercin is unfermentable, does not reduce Fehling's solution, but does reduce ammoniacal silver solution. It is distinguished from inosit, which it resembles, by the higher melting point, the crystalline form, and its solubilities.—Arch. d. Pharm., Nov. 1887, 1023; from Jour. Phar. Chim., xvi., 181.

ORGANIC ACIDS.

Oxalic Acid—Value as an Emmenagogue.—Dr. F. Poulet has found oxalic acid to be a valuable emmenagogue; it was employed as follows:

℞.—Acidi oxalici	1.0
Aquæ	100.0
Syr. cortic. aurantii am.	30.0

M. Sig.—A teaspoonful every hour.

—Amer. Jour. Pharm., Sept. 1887, 440; from Phil. Med. Times.

Succinic Acid.—Principal product of the oxidation of ecgonin. See *Cocaine*, under "Organic Bases."

Acetic Acid—Yield from Different Woods.—Mr. Jokowlen communicates the results of experiments made to determine the yield of acetic acid from different kinds of wood. He operated on quantities of from 20 to 50 grams of wood dried at 120° C. The dry distillation was effected in an ordinary glass retort. The still was heated to 150° C., and then the temperature slowly raised at about the rate of one degree a minute until it reached 300° C. It was maintained at this point until the wood was exhausted of all the volatile products. The quantity of acetic acid present was determined by titration with caustic baryta. The following is the yield obtained from one hundred parts of wood:

Linden	10.17 to 10.24
Birch	9.29 " 9.52
Ash	8.06 " 8.37
Oak	7.92 " 8.24
Fir	5.65 " 6.12
Pine	5.09 " 5.24
Oak bark	2.20 " 2.38

These experiments indicate that deciduous trees are richer in acid than the coniferous.—Drugg. Circ., Nov. 1887, 249; from Moniteur des Produits Chim.

Acetic Acid—Addition of Glucose to Raise its Specific Gravity.—Mr. Massol draws attention to the occurrence of glucose in a sample of commercial acetic acid. The sample had the s. g. 1.070, which would have corresponded with 62.5 per cent. of glacial acetic acid. The sample, in the process of purification, yielded a rather abundant yellow-brown syrupy distillation residue, and, by acidimetric tests, was proved to contain only 31.44 per cent. of anhydrous acetic acid, and should properly have had the s. g. 1.043. The impurity amounted to 6.87 per cent., and consisted of glucose evidently added to raise the specific gravity of the sample so as to simulate an acid of double its actual strength.—Phar. Jour. and Trans., March 31, 1888, 824; from Jour. de Phar., March 1, 1888, 248.

Acetic Acid—Presence and Detection of Formic Acid.—Mr. Frank X. Moerk, having observed a reduction of mercuric chloride to mercurous chloride by acetic acid and acetates employed in certain manipulations, suspected the presence of formic acid, and subsequently proved this to be a frequent contaminant of commercial acetic acid. He has also determined a method for the quantitative determination of formic acid in such association. He found the hydrochloric acid that is liberated by the reaction to interfere with the accuracy of the process, but that free organic acids do not interfere. Hence the reaction is allowed to take place in presence of sodium-potassic tartrate (Rochelle salt), the liberated hydrochloric acid acting upon this and setting free tartaric acid. The best base to hold the formic acid in combination for the purpose of establishing a method was found to be sodium. Hence the formic acid was first converted into a sodium salt. Copper formate also gave good results. The method for establishing the process was as follows: Take 0.1 to 0.2 gm. of the formate, 2 gm $HgCl_2$, 1 gm. $NaKC_4H_4O_6$ and 150 c.c. of water; boil for one-half hour, then add 10 c.c. of hydrochloric acid, in order to dissolve any oxide or tartrate which might possibly be precipitated through some impurity, filter through a weighed filter, wash the precipitate with boiling water until the washings cease to precipitate silver nitrate, dry at 100° C. and weigh.

After showing the reliability of the analytical process, a number of samples of acetic acid and acetates were examined, and the amounts of formic acid or andydrous formate of the metal are thus summarized:

	Sample.	Percentage.
No. 1.	No. 8 Acid.	0.642
No. 2.	U. S. P. "	0.344
No. 3.	U. S. P. "	0.020
No. 4.	Glacial "	0.049
No. 5.	Na $C_2H_2O_3$ (C. P.)	0.954
No. 6.	$KC_2H_3O_2$	free, but contains considerable butyrate.
No. 7.	Cu $(C_2H_3O_2)_2$	" " a trace of butyrate.
No. 8.	Pb $(C_2H_3O_2)_2$	free.
No. 9.	Zn $(C_2H_3O_2)_2$	contains both formate and butyrate in small quantities.

These examinations were carried out as with sodium and copper formates, using, however, 10 gm. of the samples.—Amer. Jour. Pharm., March 1888, 131–135.

Spirit Vinegar—Manufacture.—Mr. Edward Kremers contributes a practical paper in which he details the method of manufacture of "spirit vinegar," so-called. The materials used are Indian corn (maize), rye, and malt, and the product is claimed to be very pure and satisfactory. For the details reference must be had to the original paper in the Pharm. Rundsch., Aug. 1887, 185–187.

Cider Vinegar—Analysis.—Mr. B. F. Davenport communicates a detailed practical method of determining whether a sample of cider or apple vinegar conforms to the requirements of the Massachusetts statute relating thereto, which requires that it should be not only the legitimate and exclusive product of pure apple juice or cider, but also that it should not fall below 4½ per cent. by weight of absolute, that is monohydrated acetic acid, and should yield upon full evaporation at the temperature of boiling water, not less than 2 per cent. by weight of cider vinegar solids. For the details of the method reference must be had to the original. It may be briefly stated to be as follows: The vinegar is titrated with volumetric solution of soda, with phenolphthalein as indicator. To make the latter more evident, the measured sample is diluted with water to a nearly colorless condition. The residue of evaporation is obtained in the manner explained by the requirement. It will usually amount to about 3 per cent.; is always soft, viscid, of apple flavor, and somewhat acid and astringent. Ignited in a platinum wire loop it leaves an alkaline bead, this alkalinity being prevented by the presence of free mineral acid. For other qualitative tests see Western Drugg., Jan. 1888, 13–14.

Calcium-Copper Acetate—Preparation, etc.—Mr. Fr. Rüdorff finds the composition of this compound, which was first prepared by Ekling, to be: $Ca(C_2H_3O_2)_2+Cu(C_2H_3O_2)_2+6H_2O$. It is best prepared by dissolving 25 grams (1 mol.) copper acetate and 66 grams (3 mol.) calcium acetate in 350 c.c. of water at a moderate heat, filtering the solution, and allowing it to cool, when the double salt crystallizes out in handsome crystals. A second crop of crystals may be obtained upon moderate evaporation, but if evaporated too far calcium acetate will crystallize out along with the double salt.—Arch. d. Pharm., April 1888, 367; from Ber. d. D. Chem. Ges., 1888, 279.

Aceto-Phosphate of Copper—Use in Tuberculosis.—Dr. Luton, wishing to make use of copper in tuberculosis on account of its parasiticidal properties, first tried the phosphate, but this being insoluble, he now administers, concurrently, the acetate of copper and the phosphate of sodium. The double decomposition augments, so he believes, the activity of the medicament. He gives pills, potions, and hypodermic solutions. For pills he uses neutral acetate of copper, 1 cgm.; crystallized phosphate of sodium, 5 cgm.; liquorice and glycerin q. s.—the latter to prevent hardening. The salts must be dried and mixed before making the pilular mass, an addition of water being indispensable to the reaction. Or, a small pill of acetate of copper may be made, and afterwards rolled in pulv. phosphate of sodium. The potion contains: of the cupric acetate, 5 cgm., phosphate of sodium, 50 cgm.; mucilage, 125 gm. Or, each of the chemicals may be made with one-half of the menstruum and given separately at the same time, thus permitting the reaction to take place in the stomach.—Rev. de Clin. et de Thérap., Sept. 8, 1887.

Valerianic Acid—Preparation by the Aid of Permanganate of Potassium.—Mr. E. Duclaux, finding it necessary to have some absolutely pure valerianic acid, made experiments which show that permanganate of potassium is the most suitable oxidizing agent for amylic alcohol. In the presence of permanganate of potassium, and in the cold, amylic alcohol is oxidized to valerianic acid, but it is necessary that the amylic alcohol shall be employed in excess, so as to avoid the formation, as much as possible, of acetic acid. The latter is, however, formed in small proportions under any circumstances, but is comparatively easy of separation; the dilute solution of the acids being subjected to fractional distillation, when the first one-fourth of the distillate will contain mainly valerianic acid and only traces of acetic acid. By repeating the operation several times, the acetic acid may be completely eliminated. By the author's method it is therefore possible to obtain valerianic acid absolutely pure, or nearly so.—Amer. Drug., Sept. 1887, 169; from Compt. Rend., cv. 171.

Lactophosphate of Calcium—Preparation.—See *Phosphate of Calcium* under "Inorganic Chemistry."

Capric Acid—Wool-Washings a Source.—Messrs. A. and P. Buisine have found a new source of capric acid in the washings of wools. When these waters are slightly acidulated, a complex, fatty matter is separated, which is found mixed with fat acids in saponification with potash; and also neutral fatty principles are present, held in emulsion in the liquid. This fat is the first matter from which we extract capric acid; it gives about five per cent. But capric acid in quantity is not present in the fresh washings of wools; they must be old, *i. e.*, have undergone fermentation, before much of the acid can be found. The authors state that this "augmentation is due to the action of microbes, for it is not found in sterilized waters." They say furthermore "that this formation of a fat acid by microbes is interesting, from the fact that up to this time we have had no knowledge concerning the mode of generation of fatty substances."—Moniteur Scientifique, Nov. 1887.

Alanin Mercury (*Hydrargyrum Amidopropionicum*) — *A New Antisyphilitic.*—According to Dr. Lucca this compound has the advantage over other antisyphilitics in that it produces no disagreeable attendant symptoms, and is effective in relatively small quantities, the highest dose per day being 0.10 gram, and much smaller quantities usually sufficing. It may be administered internally or subcutaneously. To prepare "alanin mercury," crystallized amidopropionic acid is dissolved in 19 parts of water, heated to boiling, and mercury added as long as it is dissolved. The filtrate is then rapidly evaporated, and then separates the compound in white crystalline needles.

Amidopropionic Acid (alanin: CH_3CHNH_2COOH) is obtained by heating aldehyd-ammonia with a mixture of hydrocyanic acid and dilute hydrochloric acid.—Pharm. Jour. and Trans., June 30, 1888, 1085; from Apoth. Ztg., June 20, 1888, 413.

Sodium Sulphibenzoate—A New Antiseptic.—Mr. Heckel calls attention to a new antiseptic, sodium sulphibenzoate, which is the outcome of an attempt to combine the antiseptic properties of sulphite and benzoate of sodium, being obtained by dissolving the latter in a strong solution of sulphite of sodium. The chemical and physical properties of the new compound are not given, beyond the statement that it is soluble in water at the ordinary temperature. It is stated to be absolutely innocuous to the human organism in large doses, and to possess very considerable antiseptic properties. Used as an application to wounds in solution of 4 or 5 grams to a litre of water, it is said to be superior to carbolic acid, and comparable to mercuric salts without their toxicity, or to iodoform without its disagreeable odor.—Pharm. Jour. and Trans., Dec. 3, 1887, 457; from Compt. rend , cv. 896.

Benzoic Sulphinide (Saccharin)—Question of Discovery.—Prof. Ira Remsen communicates some facts respecting the investigations that led to the discovery of "saccharin," or more properly "benzoic sulphinide," from which it appears that the original investigations which subsequently led to the discovery of this interesting substance, were made by him more than ten years ago. They were again taken up by him after he became connected with the Johns Hopkins University, his assistant being Mr. C. Fahlberg. The new compound was described by him in an article which appeared in Amer. Chem. Jour., Vol. i., p. 426, under the names of Ira Remsen and C. Fahlberg.—Pharm. Rundschau, Dec. 1887, 278, 279.

Saccharin—Characters of the Commercial Article.—Mr. W. A. H. Naylor, referring to the following paper of Mr. Gravill, emphasizes three points on which his observations respecting commercial saccharin differ from that described by the latter. These are the temperature of fusion, the amount of fixed residue, and the non-liberation of boracic acid from a solution of borax. The sample examined by Mr. Naylor was taken from a stock of ten kilograms. It presented the appearance of a white amorphous powder, and when viewed under a 1/4-inch objective no crystalline structure was discernible. It had a decided odor, recalling that of myrrh. On the palate it produced a sensation of sweetness which was intense, somewhat sickly, and unpleasantly persistent. Heated in an air-bath it gave a slight sublimate at 110° C.; at 172° C. it assumed a pasty condition, but liquefied only when the thermometer registered 197.5° C. Ignited with free access of air it gave a residue of not less than 6.67 per cent. It failed to liberate boric acid from a solution of borax either in the cold or on boiling, or after heating in a water-bath for four hours.—Pharm. Jour. and Trans., Nov. 5, 1887, 377.

Saccharin—Solubilities, etc.—Mr. Edward D. Gravill describes saccharin as it occurs in the London market, and speaks of the indifferent character of some samples met with. He has determined the solubilities of a sample representing the first supply offered as a commercial article. With the exception of the boiling water, the temperature of the solvents was at 60° F.

Boiling water dissolved	0.60	parts per 100 by volume.
Cold " "	0.20	" " "
Alcohol, .800, "	4.25	" " "
Rectified spirit, .838, dissolved	3.20	" " "
Ether, .717, "	1.00	" " "
Chloroform, 1.49, "	0.20	" " "
Benzene, "	0.40	" " "
Petroleum ether, insoluble.		

It is also sparingly soluble in glycerin and fixed oils, and to a greater or less extent in volatile oils. Benzoic aldehyde dissolves saccharin in large quantities. Saccharin has very decided acid properties, combines readily with alkalies, replacing carbonic acid, and forming very soluble salts. Their solutions possess the further advantage over those of saccharin uncombined, that the harsh flavor of the pure substance is destroyed, while the sweetness appears to be distinctly intensified.—Phar. Jour. and Trans., Oct. 22, 1887, 337.

Saccharin—Delicate Test.—Mr. Börnstein recommends as a delicate test for saccharin a process based upon the formation of a compound analogous to "fluorescein" when commercial saccharin is heated with resorcin and sulphuric acid. The saccharin is removed from the substance containing it by suitable treatment with ether and is then heated in a test-tube with a slight excess of resorcin and a drop or two of sulphuric acid. The mixture becomes yellow, red, and then dark green, and strong ebullition sets up with abundant evolution of sulphurous acid vapor, which continues a short time after the removal of the flame. The ebullition is repeated once or twice, after which the mixture is allowed to cool, diluted with water, and supersaturated with alkali. In this way a solution is obtained which appears reddish by transmitted light, but shows a strong green fluorescence in reflected light. This reaction is stated to be so delicate that if only a milligram of saccharin has been used, the liquid may be diluted to five or six liters without the disappearance of the fluorescence. It seems probable, however, that this reaction is due to an impurity—namely, orthosulphobenzoic acid—which Salkousky has found to be present, together with parasulphaminbenzoic acid, in commercial saccharin; for the above mentioned reaction was first observed by Remsen as taking place with orthosulphobenzoic acid.—Pharm. Jour. and Trans., June 2, 1888, 1005; from Zeitschr. Analyt. Chem., xxvii., 167.

Saccharin—Tests.—Mr. C. Schmitt proposes a test for saccharin, which is based upon the fact that it is converted into salicylic acid by heating with caustic soda. Treat the suspected substance a few times with a mixture of equal parts of ether and benzine, mix the separated extracts, add a little soda lye, and evaporate nearly to dryness. Heat the residue for half an hour in a silver or porcelain dish to 250° C.; dissolve in water, and extract the salicylic acid (if any) with ether; evaporate the ethereal extract to dryness, dissolve in a little water, and add a few drops of chloride of iron solution. A red color denotes the presence of saccharin. If salicylic acid be present from the start, the process, of course, cannot be employed. The manufacturers give the following process for testing sugar for saccharin: A test-tube, pointed and open at the lower end (a glass syringe answers best), containing about 1 fluid ounce, is closed at the lower orifice by a piece of cork or rubber, and is filled with the coarsely-powdered sugar to be tested: the tube charged with the sugar is filled with ether, and is left standing for about one hour; then the lower orifice is opened and the ether allowed to flow off into a small porcelain capsule; by placing this in a moderately warm place the ether evaporates, leaving any traces of saccharin behind, which is best and very perceptibly recognized by its extremely sweet taste. It may further be recognized by fusing in the capsule containing the ether residue, at a very gentle heat, a few grains of a mixture of 6 parts of sodium carbonate and 1 part of potassium nitrate, subsequently heating the mass to redness. The residue, when cold, is dissolved in a little distilled water, and the filtered solution tested with a few drops of solution of barium chloride. An ensuing white turbidity of barium sulphate would prove the presence of saccharin, which forms, by incineration, sulphuric acid, whilst no other sulphates possibly contained in the sugar would be extracted by the ether.—Drugg. Circ., Nov. 1887, 251; from Schweiz. Wochenschr. f. Pharm.

Saccharin—Relative Sweetness, etc.—The manufacturers of saccharin recommend two standard dilutions, the one a liquid and the other a solid, which are afterwards to be used as bases for other preparations. The component parts of the two dilutions are respectively:

1. Solution of Saccharin.

Saccharin.
Diluted alcohol.

Of such strength that 1 gram of the solution is equivalent, in sweetening power, to 15 grams of syrup.

2. Mixture of Saccharin.

Saccharin.
Mannite.

Of such strength that 1 gram of the mixture is equivalent, in sweetening power, to 10 grams of sugar.

Commenting on these singular formulas, the editor of "Amer. Drugg." remarks that when 1 gm. of saccharin is dissolved in 100 c.c. of diluted alcohol, it requires about 8 c.c. of this solution to give to plain water approximately the same degree of sweetness as is imparted to the same amount of water by 15 gm. of syrup, with addition of as much diluted alcohol as has been introduced into the first mentioned solution. This would make the relative sweetening power of saccharin as compared with sugar about 1 to 122; but subsequent observations lead him to modify his first one, and he thinks that the relation of 1 to 100 is more nearly correct. Moreover, since the taste of the saccharin preparations is not absolutely identical in character with sugar preparations, and there is particularly to be noticed a peculiar, almost irritating, but faint after-taste, it is not so easy to establish a rate of dilution which would be regarded by everybody else as uniform with a certain strength of a sugar preparation, the author's remarks being exclusively based on his individual impressions.—Amer. Drugg., Nov. 1887, 202.

Saccharin—Influence upon Peptic Ferments, which see.

Saccharin—Preparation of a Glycerite for Convenience in Sweetening Food, etc. See *Glycerita*, under "Pharmacy."

Alpha-Oxynaphthoic Acid—A New Antizymotic.—Messrs. Gehe & Co. draw attention to alpha-oxynaphthoic acid, which is now an article of commerce, and has been pronounced to be a very powerful antiseptic and antizymotic. It being rather poisonous, it cannot be used as a substitute for salicylic acid for the purpose of preserving food; but it is supposed that it may be used internally in diseases of the intestines and febrile diseases. Its chief field of usefulness will, however, be that of disinfection. —Amer. Drugg., June 1888, 106; from Gehe & Co.'s Handelsbericht, April, 1888.

a-Oxynaphtoic Acid—Characters and Uses.—Prof. J. M. Maisch draws attention to α-oxynaphtoic acid, which has been recommended as a valuable disinfectant. Eller, who first prepared this compound twenty years ago, named it carbonaphtholic acid. Subsequently L. Schäffer (Annalen, 1869, vol. 152, p. 291), distinguished the α and β acids, of which the former is colored blue, but the latter purplish-black, by ferric chloride. R. Schmitt, in 1884 (Berichte, 1885, Ref., p. 204), had a process patented for the manufacture of carbonaphtolic or oxynaphtoic acids, which consisted in treating sodium naphthol with carbonic acid under pressure and heating to between 120° and 140° C. Of the various compounds which may thus be obtained, the α acid is now prepared on a large scale, and has been ascertained to possess valuable disinfectant properties. It crystallizes in colorless needles, has an odor recalling that of naphthol, is sternutatory, and when carefully heated sublimes without decomposition. It is soluble in alcohol and ether, but requires about 30,000 parts of water for solution. This solution of the pure acid remains unaltered on exposure, but that of the crude acid turns yellow and red. On boiling decomposition takes place with the production of carbonic acid and naphthol. The crude acid leaves about 0.4 per cent. of ash. Its antizymotic properties are considerably greater than those of salicylic acid. It has been found, when added to the substances named, to prevent the decomposition of blood, urine, mucilage, paste and similar articles, and to render sinks and water closets inodorous. Owing to its poisonous properties it is not adapted for the preservation of articles of food, but as a surgical antiseptic it appears to be useful, and an *oxynaphtoic collodium* has been recommended containing one-half per cent. of this compound.—Amer. Jour. Pharm., June 1888, 275.

Oxynaphthoic Acid—Preparation, Characters and Antiseptic Value.—The following account of the preparation of *a*-oxynaphthoic acid is given in "Industrie Blätter." It is obtained by heating sodium alpha-naphtholate with carbon dioxide. From the solution of the crude sodium salt, the acid is precipitated in quite a pure state, by the addition of a mineral acid. The chemical formula is $C_{10}H_6\left\{\begin{matrix}COOH\\OH,\end{matrix}\right.$ or $C_{11}H_8O_3$. It therefore bears the same relation to alpha-naphthol that salicylic acid does to phenol. In a pure state it is a white, perfectly odorless, microcrystalline powder, which becomes electric by friction and melts with decomposition in a capillary tube at 106° C. The dust-like acid when inhaled causes violent sneezing. It has an acrid taste. In water it is very difficultly soluble. Its solubility in cold water is about 1 in 30,000, provided the water contains no bicarbonates of the alkalies or alkaline earths, or ammonia. These bodies form soluble salts with the acid, so that river or well water dissolves a considerably larger proportion than that above mentioned. In strongly acid water, on the contrary, the acid is much less soluble than in pure water, the solubility being about 1 in 80,000. Boiling water dissolves about 0.75 grams per liter, the greater part of which again separates on cooling. By continued boiling with water, the acid is decomposed into alpha-naphthol and carbon dioxide. The pure aqueous solution is colored blue by the addition of a drop of ferric chloride. The cold alcoholic and other solutions contain about 0.1 gram per cubic centimeter. Hot alcohol dissolves a much larger quantity. In chloroform and benzine it is much less soluble than in alcohol. It is also soluble in warm glycerin, in essential and fatty oils, e. g. in oil of turpentine and linseed oil. In determining the antizymotic action of oxynaphthoic acid as compared with salicylic acid, it was found that 0.06 gram of alpha-oxynaphthoic acid will kill the same quantity of yeast cells as 0.3 gram of salicylic acid. Therefore oxynaphthoic acid is five times as effective as the same weight of salicylic acid.—Drugg. Circ., Jan. 1888, 9.

Salicylic Acid—Distinction Between the Artificial Acid and that from Oil of Wintergreen.—Mr. Jos. F. Burnett, having in a former communication to the Chemists' Assistants' Association stated that artificial salicylic acid reduced a dilute solution of potassium permanganate more rapidly than that from oil of wintergreen, and doubt having been expressed as to the conclusiveness of the experiment because he had failed to try Schering's dialyzed acid, has repeated his experiments, using a sample of Schering's dialyzed, Kolbe's, the natural, and a sample of artificial acid from an unknown source. In each case the artificial acids exercised the reducing action more rapidly than in the case of the natural, thus confirming his previous observations.—Pharm. Jour. and Trans., April 7, 1888, 854.

Salicylic Acid—Estimation in Wines, etc.—Mr. W. H. Ince has experimented with a view to overcoming the difficulty of separating the salicylic acid from wines, etc., in a sufficiently pure form to apply the reagents. As a result he recommends to acidulate 210 c.c. of the liquid with 10 c.c. of dilute sulphuric acid; to distill; to reject the first 50 c.c. that pass, and to collect the next 100 c.c. distillate, which is treated with 10 c.c. of a 10 per cent. solution of mercuric nitrate in dilute nitric acid. According to the quantity of salicylic acid present in the distillate the color reaction (red) will be more or less intense, and its intensity is compared colorometrically with standard solutions of salicylic acid of known strength, and containing a little alcohol. Ferric chloride solution may be substituted for the mercuric nitrate solution, the color reaction being estimated in the same way. The author appends a table showing the results obtained by the method with different wines to which varying quantities of salicylic acid had been added.—Yearbook of Pharm., 1887, 497-501.

Salicylate of Lithium—Cause and Prevention of Discoloration of its Solutions.—Mr. Julliard observes that he dispensed an aqueous solution, made by carefully neutralizing lithium carbonate with salicylic acid, obtaining a colorless solution, but in a few days the solution was returned, having changed to a coffee-brown color. Colorless and unchangeable solutions were obtained from several commercial samples of lithium salicylate, but nearly all had a weak acid reaction and contained sodium compounds. The estimated amount of salicylate of sodium present was 12 to 15 per cent. The question arose whether the salicylate of sodium or the free salicylic acid prevented the discoloration, and he found that this favorable effect is produced by free salicylic acid, even when present only in small amount, thus again confirming the experience for years with salicylate of sodium, that preparations of salicylates to remain colorless, must contain a small amount of free salicylic acid.—Pharm. Zeitg., 1887, p. 423.

Salicylate of Magnesium—Preparation and Characters.—Mr. B. Fischer prepares salicylate of magnesium—which has been recommended by Dr. Huchard in abdominal typhus as superior to salicylate of bismuth—by dissolving salicylic acid in boiling water, saturating the solution with magnesium carbonate, filtering and crystallizing. It forms long, colorless needles, is readily soluble in water and alcohol, and has a somewhat bitter taste. When given in large doses of 3 to 6 gm. daily, it causes no unpleasant effects.

Salicylate of Mercury—Preparation and Characters.—Mr. B. Fischer describes salicylate of mercury—which is said to be prepared by precipitating mercuric nitrate with a salicylate of an alkali, washing with water and diluted alcohol, and drying in the shade—as a white inodorous and tasteless powder of neutral reaction, very sparingly soluble in water or alcohol, but soluble in solution of table salt. It is decomposed by acetic, tartaric, lactic or carbonic acid, but mineral acids liberate salicylic acid. It contains 59 per cent. of hydrogen, and its formula is $C_6H_4CO_2OHg$. Its complete solubility in caustic soda solution may serve as a test for its purity. A solution for dispensing may be prepared by triturating 10 gm. of the salt with 15 or 20 gm. of sodium chloride dissolved in water, adding about 150 gm. water, heating in a water bath until solution is effected, and diluting with 2500 c.c. hot water.—Pharm. Ztg., 1888, 146.

Salol—Preparation, etc.—Mr. Chas. G. Merrel reviews the three methods given for the preparation of salol by the inventors, and also that of Dr. Hugockenroth (see Proceedings 1887, 296), based upon the intervention of phosgen gas in place of pentachloride of phosphorus. He states that salol may also be formed by first heating for some time in closed vessels a mixture of phenol carbonate, sodium hydrate and phenol at 180° to 200°, allowing it to cool a little and then treating the mass with phosphorus oxychloride or phosphorus pentachloride. The latter method avoids the formation of a phosphoric acid, phenyl ester, occasioning loss of salol, as is the case when salicylic acid and phenol are directly treated. The salol thus formed is purified by dissolving out the phosphate and chloride of sodium with warm water, then washing with a solution of sodium carbonate and treating with alcohol or benzol for recrystallization.—West. Drugg., March 1888, 81–82.

Picramic Acid—Characters etc., of some of its Salts.—Mr. A. Smolka has prepared several salts of picramic acid and studied their characters.

Picramate of Sodium.—$NaC_6H_4N_3O_5+H_2O$, obtained by adding the calculated quantity of Na_2CO_3 into the aqueous solution of picramic acid, constitutes dark-red crystalline crusts.

Picramate of Magnesium.—$Mg(C_6H_4N_3O_5)_2+3H_2O$, obtained by boiling magnesium monohydrocarbonate with picramic acid and water, crystallizes in small dark-red leaflets.

Picramate of Cadmium.—$Cd(C_6H_4N_3O_5)_2+H_2O$, obtained in a similar manner to the above, forms green-yellow needle-shaped crystals.

Picramate of Lead is anhydrous, and forms red brown needles.

Picramate of Manganese.—$Mn(C_6H_4N_3O_5)_2+2H_2O$, constitutes steel-green, glistening needles.

These different salts give, according to their solubility in water, dark blood-red to light orange-colored solutions. When they are heated slowly they are slowly decomposed at a temperature of about 150° C. and lose in weight, but if rapidly heated, explosion takes place—without detonation, however—the explosions being most violent in the instances of the sodium and the lead salts.—Arch. d. Pharm., Oct. 1887, 929; from Monatsh. f. Chem., 8, 391.

Citric Acid—Modification of the Test of the Germ. Pharm.—Mr. Th. Pusch draws attention to the fact that the amount of lime water employed in determining the identity of citric acid must be in decided excess in order to cause a re-solution of the precipitate formed upon boiling a mixture of the two. If to 1 c.c. of the solution of citric acid (10 per cent.) 35 c.c. of freshly prepared lime water is added, and the mixture is heated to boiling, the precipitation is complete in 5 minutes, but it does not again disappear on cooling and standing, as required by the Pharmacopœia. If the quantity of lime water is increased to 40 or 50 c.c. it disappears completely after standing in the cold for 1 to 1½ hours and shaking. The author therefore recommends the change of this portion of the requirement of the G. P. test, as follows: 1 c.c. of the aqueous solution (of citric acid 1:10) remains clear when mixed with 40 to 50 c.c. of lime water, but when boiled for one minute, deposits a white flocculent precipitate, which when cooled in a closed vessel redissolves completely in from 1 to 1½ hours.—Arch. d. Pharm,, Dec. 1, 1887, 1052–1055.

Ferrous Citrate—Formula for Preparation.—Prof. C. T. P. Fennel finds the following to be the most satisfactory formula for making ferrous citrate in form of solution and in scales: Place 226 parts of ferrous sulphate, 114 parts of citric acid, and 160 parts of barium carbonate into a flask of suitable capacity, add 500 parts of distilled water, and let the mixture stand on a hot water-bath, with frequent agitation, until effervescence ceases. Filter through paper into a tared flask, and having rinsed the flask with a little boiling water, pass the washings through the filter, and continue to pass boiling water through the filter until the filtrate shall weigh 1,000 parts. The solution so obtained is pale green, odorless, has a slight ferruginous taste, has an acid reaction, and the s. g. 1.012. Evaporated to a syrupy consistence at a gentle heat, it may be spread on glass plates and forms, on drying, dark red scales. The solution contains 14.833 per cent. of anhydrous ferrous citrate—$Fe_3,2C_6H_5O_7$.—Pharm. Era, July 1887, 249; from Proc. Ohio State Pharm. Assoc., 1887.

Citrate of Iron and Quinine—Commercial Quality.—Mr. Millard Caldwell has examined samples of citrate of iron and quinine from five large American manufacturing firms and found them all to be below the standard as regards the percentage of quinine, and slightly so as regards the oxide of iron. The officinal preparation should contain 12 per cent. of quinine. The samples contained 10.30, 9.48, 7.35, 6.98, 5.70 and 7.96 per cent. respectively.—Pharm. Era, Sept. 1887, 322; from Proc. Indiana Phar. Assoc., 1887.

Citrate of Iron and Quinine—Determination of Quinine in Commercial Samples.—Mr. E. C. Federer records the results of the examination of commercial samples of citrate of iron and quinine. Nine separate ounces in original bottles from different prominent manufacturing chemists were obtained. All but one constituted greenish scales, very soluble, and contained ammonia. The exceptional sample was in deep garnet scales and was free from ammonia and quite difficultly soluble. The samples were all assayed by the U. S. P. process, and the circumstances for each made as uniformly alike as to heat, etc., as possible; drying was done in hot air to constant weight; the heat never exceeded 210° F., nor went lower than 190° F. The results are summarized as follows:

No.	Labels on Bottles Claim	Percentage of Quinine Fonnd.
1.	Nothing specified	9.2125
2.	English style; contains officinal amount of quinine	11.5
3.	Full strength U. S. P. quinine	10.0
4.	Soluble; contains full U. S. P. amount of quinine	12.35
5.	12 per cent. quinine; *no ammonia**	10.85
6.	Full officinal quantity pure quinine	10.25
7.	U. S. P. quinine strength	12.5
8.	Nothing specified.	2.75
9.	Full officinal quantity pure quinine	11.5
	Standard U. S. P.	12.0

—Pharm. Era, Oct. 1887, 357–358.

Pyruvin—Formation by the Distillation of Citric Acid and Glycerin.—Messrs. Clermont and Chautard report the formation of pyruvin as the unique product of the distillation of citric acid and glycerin. This unexpected result they regard as curious; for, while it is known that pyruvin is obtained from the distillation of tartaric acid with glycerin, it is difficult to understand how the same substance is obtained under the same conditions from so different a compound as citric acid. Erhardt succeeded in preparing pyruvin by distilling glyceric acid with glycerin. It appears probable that in this operation the pyruvin originates in this way, and that the glyceric acid is formed in the course of the reaction at the expense of the glycerin or the acrolein. The authors could isolate no other product in the process. They sought carefully for the pyrocitric acids, but could find no trace, and they admit that the citric acid was entirely destroyed.—Amer. Jour. Phar., Jan. 1888, 14; from Moniteur Scientifique, Nov. 1887.

Bitartrate of Potassium—Estimation in Argols.—Mr. F. Klein proposes a new method for estimating the bitartrate of potassium in argols. The method, while not absolutely sharp, has the advantage of indicating the quantity that is likely to be obtained in the process of manufacture, and in being simple and expeditious. It depends on the difficult solubility of bitartrate of potassium in a solution of chloride of potassium, and is as follows: Take a quantity of the material approximately containing from 1.8 to 2.2 gm. of cream of tartar, boil this with five successive portions of distilled water, filter, and wash the residue with boiling distilled water, until the washings cease to have an acid reaction. Evaporate the united filtrates to 40 c.c., allow to cool, add 5 gm. chloride of potassium, stir for 15 minutes, and filter at once. Then collect the precipitate on a filter, wash it with a 10 per cent. solution of chloride of potassium, which has been previously saturated with pure cream of tartar at the ordinary temperature, and finally determine the tartaric acid volumetrically. (Why not weigh the cream of tartar on filter? Rep.)

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* The author found this sample to contain ammonia.

Arthur Bornträger has determined the solubility of cream of tartar in solution of chloride of potassium, and recommends to add for every two grams of cream of tartar found by Klein's method, the figure 0.033, before calculating the percentage.—Amer. Drugg., Dec. 1887, 226; from Rep. d. Anal. Chem., No. 39, 1887.

Cream of Tartar—Commercial Quality.—Mr. Frank Thompson found a sample of cream of tartar purchased from a New York firm to contain 33⅓ per cent. of flour. He was induced by this observation to examine some samples procured from grocery stores. Not a single sample of these was pure. One sample contained as high as 75 per cent. of starchy matter, while another contained 25 per cent.—Proc. Penn. Pharm. Assoc., 1888, 36–37.

Cream of Tartar—Commercial Quality.—Mr. J. H. Lyne has subjected commercial samples of cream of tartar to examination. Dividing them into two groups—the "druggists" and the "grocers" group, he finds the specimens from drug stores to be free from adulterants, though most of them contain an undue proportion of tartrate of calcium, the results showing the presence of 5, 9, 10 and 12 per cent. respectively. In the specimens from grocery stores he found enormous quantities of sulphate of calcium in three samples, while a fourth contained 12 per cent. of tartrate of calcium. The adulterated specimens contained respectively 37, 48 and 56 per cent. of gypsum and 13, 16 and 14 per cent. of tartrate of calcium.—Proc. Ky. Pharm. Assoc., 1888, 27–29.

Tartrate of Antimony—Improved Method of Preparation.—The method of Peligot for the preparation of tartrate of antimony yields a compound of variable composition. To obtain a compound of constant composition—2 eq. antimonic oxide and 5 eq. tartaric acid—Mr. Yuntz now recommends the following method: An excess of oxide of antimony is boiled with solution of tartaric acid; the clear solution is evaporated in the water bath to syrupy consistence, allowed to cool, and the crystalline precipitate which forms is washed with absolute alcohol. The solution may also be evaporated to complete dryness, and then washed with absolute alcohol, which removes the excess of tartaric acid and leaves the pure bitartrate of antimony in form of white crystalline scales of composition $C_4H_5(SbO)O_6$ when dried at 100° C.—Arch. d. Pharm., July 1887, 641; from Jour. Pharm. Chim., 1887, 514.

Tartar Emetic—Commercial Quality.—Mr. Kaspar Hœrner examined three commercial samples of tartar emetic and found them to agree well with the requirements of the Pharmacopœia, except in respect to their solubility in water. A carefully prepared specimen made by the author also agreed well in this respect, the following being the solubilities observed:

Solubility of one part of tartar emetic:

OWN MAKE.	NO. 1.	NO. 2.	NO. 3.
In 17¼ parts.	In 20 parts.	In 26 parts.	In 18 parts of water at 15° C.
In 3 "	In 3½ "	In 5 "	In 3¼ parts of boiling water.

—Amer. Jour. Pharm., March 1888, 135–136.

Eriodictyonic Acid—Characters, etc.—Mr. A. Quirini has isolated from the leaves and stalks of *Eriodictyon glutininosum* the peculiar acid constituent of the drug, which he has named "eriodictyonic acid." If the deep green-brown alcoholic extract of the plant be treated with boiling water, upon cooling a light yellow crystallization of eriodictyonic acid forms, mixed with a green resinous body, from which it can be separated by means of dilute alkaline solution, in which it dissolves with a red-brown color. The yield is about 2.4 per cent. The acid is described as forming delicate yellow plates, with a dull lustre, melting at 86° to 88° C., very hygroscopic, neutral in reaction, and having a sweet-sour taste. It is not precipitated from solution by acetate of lead, sulphide (sulphate ? Rep.) of copper, corrosive sublimate, gelatin or tannin, but is readily precipitated by ferric chloride, forming a reddish-black precipitate which is soluble in ammonia. It is probably a phloroglucin, its composition being represented by the formula $C_6H_3(OC_4H_7O)_2HO$. The author has used the acid successfully for masking the taste of quinine in pastilles.—Zeitsch. Oest. Apoth. Ver., April 1, 1888, 159–160.

Helvellic Acid.—The poisonous constituent of *Morchella esculenta*, which see under "Materia Medica."

Kombic Acid.—An acid associated with strophanthin in *Strophanthus hispidus*, which see under "Materia Medica."

Iodocholic Acid—A New Type of Blue Iodine Compounds.—Mr. F. Mylius describes iodocholic acid $(C_{20}H_{40}O_5I)_4$, $KI + xH_2O$, which is obtained by adding a concentrated aqueous solution of 1 gm. of potassium iodide to a solution of 2 gm. of cholic acid and 0.8 gm. of iodide in 40 c.c. of alcohol. The mixture is gradually diluted with water until the blue substance separates. This is then collected and washed with water. It forms a matted mass of bronze-like lustre. When suspended in water (500 c.c.), an indigo-blue liquid is produced. When the latter is heated, it becomes yellow and cholic acid separates; when a few drops of the blue liquid are poured into water, the blue color disappears in a few moments, and the solution is found to contain free iodine. The substance is therefore decomposed by excessive dilution. Sulphurous acid decolorizes the liquid with separation of cholic acid. The solution is also decolorized by adding a few drops of soda solution, with formation of sodium cholate, iodide, and iodate; on adding hydrochloric acid, the blue compound is re-formed. When iodocholic acid is dried in a vacuum, a dark, lustrous, crystalline powder is obtained which dissolves in ether containing alcohol, yielding a yellow solution; this, when evaporated, leaves a yellow, amorphous substance which is anhydrous iodocholic acid. The latter becomes blue in presence of water.

The *compound* $(C_{24}H_{40}O_5I)_4$, HI is prepared by adding a small quantity of hydriodic acid to the brown solution of cholic acid and iodine. The liquid at once becomes blue. The compound is isolated in a manner similar to the potassium compound which it completely resembles. The *barium compound* $(C_{24}H_{40}O_5I)_8BaI_2$, and the zinc, cadmium, and ammonium compounds, are obtained by using corresponding iodides in the place of potassium or hydrogen iodides.—Ber. de. D. Chem. Ges., xx., 683–688; from Jour. Chem. Soc., 1887, 606.

Cocatannic Acid—Distinction of that in Coca grown in India from that Generally Described.—Mr. C. J. H. Warden, in the course of his investigation on the leaves of *Erythroxylon Coca* grown in India, noticed in employing Squibb's process for the extraction of cocaine a yellow deposit adherent to the sides of the bottle in which the acidified alcoholic extract was agitated with ether. On examination, this yellow deposit proved to be cocatannic acid. As extracted from India-grown coca leaves, however, it possesses physical properties which differ somewhat from those of cocatannin hitherto described. By suitable treatment of the leaves, which is described, the author obtained the pure substance. Obtained in fine crystallizations from boiling distilled water, it is a sulphur-colored powder, without odor and practically tasteless. Under the microscope the freshly crystallized acid was seen to consist of filiform crystals, interlaced in masses. In cold distilled water, absolute alcohol, ether and chloroform, it was very slightly soluble. The acid is very much more soluble in hot water and in boiling absolute alcohol. The air-dry acid loses 3.03 per cent. at 100° C.; at 158°–160° C., 5.26 per cent. more, rapidly absorbing the lost moisture again from the air, but not deliquescing; at 174° C., in a closed tube, it softened, but still retained its yellow color; at 189°–191° C., it melted to a deep brown liquid; at about

198°–202° C., the liquid became lighter colored, and at 208° C., a blackish ring of carbon was deposited at the upper part of the tube, and a caramel odor was evolved. On incineration, a mere trace of ash is left. The ultimate analysis of this cocatannic acid leads to the formula $C_{17}H_{22}O_{10}$, the air-dried acid containing in addion 2 mol. H_2O. Its solution gave no coloration with pure ferrous salts; but with ferric salts yielded a greenish coloration. The author has carefully studied the decomposition products of the acid, and from them, as well as the general characters of the acid, concludes that cocatannic acid is closely allied to the principles which have been described under the name of quercitric acid and querictrin.—Pharm. Jour. and Trans., May 26, 1888, 985–987.

Tannin—Preparation of a Stable Mixture with Sodium Bicarbonate.—A writer in "Pharm. Ztg." draws attention to the instability of a mixture, often prescribed in Germany, which mixture is something like the following: Tannic acid, 3; water, 180; solution of sodium bicarbonate, sufficient to make a perfectly neutral solution. This mixture soon changes to a dark color, more particularly when there is an excess of alkali. To make it remain uniform for a long time, expel the excess of carbonic acid in sodium bicarbonate solution by boiling, and the tannin solution, diluted as much as possible (in proportion of sod. bicarb., 1; tannic acid, 5), is added to the former, after cooling.—Rundschau, Prag., 1887, p. 447.

Tannin—Use of Ethereal Solution.—It is stated in "Amer. Druggist" (July 1887, 125), that ethereal solution of tannin of syrupy consistency is the latest remedy for burns. It is said to soothe pain immediately, and the evaporation of the ether leaves a pliable, non-elastic coating which is superior to collodion.

Animal Tannin.—Occurrence in the corn weevil (*Calandra granaria*), which see under "Materia Medica."

Tanning.—Influence of *Fermentation*, which see under "Albuminoids."

Gallic Acid—Superior Efficiency to Tannic Acid in Some Diseases.—Mr. T. B. Boyd observes that in certain cases—such as cases of hemorrhage in which the bleeding vessels are to be reached through the route of the circulation, gallic acid is superior to tannic acid because it is more readily transported through the blood. On the other hand, in cases in which the remedy can be brought in direct contact, tannic acid proves superior.—Proc. Ala. Pharm. Assoc., 1888, 20–21.

ORGANIC BASES.

Alkaloids—Sugar as a Reagent.—Mr. Jos. F. Burnett has made some experiments with sugar as an alkaloid reagent to show how useful it is. With codeine, morphine and veratrine the reactions with sugar and sulphuric acid are highly characteristic. Apply the test thus: Mix a trace of the alkaloid with about an equal quantity of powdered cane sugar upon a white plate, and then drop on a drop or two of strong sulphuric acid by means of a glass rod. Morphine turns light pink; codeine a deeper pink; veratrine becomes dark red, then in a few moments green, changing again to a rich dark blue. With aconitine the behavior is peculiar. It develops an orange color, after a time becoming pink in the case of exotic aconitines; but with crystallized English samples the result is such that no dependence can be placed upon it. Negative results were obtained with the following alkaloids: Quinine, quinidine, cinchonine, cinchonidine, caffeine, berberine, physostigmine, strychnine, cocaine, pilocarpine, atropine, apomorphine, brucine, and cupreine.—Pharm. Jour. and Trans., April 7, 1888, 854.

Morphine—New Test.—It is stated in "Pharm. Era" (May 1888, 178) that a solution of one part of a salt of morphine in 50,000 of water will become distinctly green if a little solution of ferric chloride, followed by a solution of ferricyanide of potassium, is added to it. With stronger solutions the color is greenish-blue or distinctly blue. The reaction depends on the reducing of the morphine on the ferric salt, and has value simply as a confirmatory test.

Morphine—Delicate Test.—Mr. J. Lister Armitage observes that when a solution of ferric chloride is added to a solution of a salt of morphine a bluish-green coloration is produced; the limit of delicacy however is about 1:2000. At the same time, however, a portion of the ferric chloride is reduced to the ferrous condition, proportionately to the amount of morphine present, and on this is based a far more delicate test, since the addition of solution of ferricyanide of potassium will give reactions with the ferrous chloride reduced by far less quantities of morphine than are recognizable by ferric chloride alone, A solution of one part of a salt of morphine in 20,000 parts of water on the addition of ferric chloride, followed by ferricyanide of potassium solution, produces an intensely green coloration; in 1:50,000 the color is still deep, though lighter, and even with 1:100,000 the reaction is obtained, after standing a few moments. —Pharm. Jour. and Trans., March 10, 1888, 761.

Morphine Hydrate—Temperature of Dehydration.—Mr. D. B. Dott observes that it appears to be generally accepted that morphine hydrate does not part with its water of hydration below 100° C., and that the compound contains 1 mol. H_2O—the formula being $C_{17}H_{19}NO_3,H_2O$. He records the results of comprehensive experiments, which conclusively show that morphine hydrate will part with all of its water at a temperature of 90° C., and, though very slowly, some is given off at lower temperatures, 75° C. for instance. Respecting the amount of water of hydration in the compound, this is larger than 1 mol. demands, the quantity found by him as an average of ten experiments being 6.56 per cent.

The formula $8C_{17}H_{19}NO_3,9H_2O$ very nearly corresponds to this percentage.—Phar. Jour. and Trans., Feb. 25, 1888, 701–702.

Morphine Hydrate—Composition, Temperature of Dehydration, etc.—Dr. O. Hesse, referring to Mr. Dott's paper on morphine hydrate, calls attention to the fact that he had already in the "Neues Handwörterbuch der Chemie" (vol. iv. 523) described morphine as losing its water of crystallization between 90° and 100° C. The crystals become dull already at 60° C., owing to the loss of some water of crystallization, but do not lose their water of crystallization entirely below 90° C., and at this temperature but slowly, while at 100° C. they rapidly become anhydrous. Respecting the amount of water of hydration—or rather crystallization—present in the morphine, the author considers Mr. Dott's view incorrect, and is convinced that the amount is exactly 1 molecule.

Another incorrect statement regarding morphine that is often found in works on chemistry, is that its melting point is little above 120° C., and that the alkaloid is decomposed at that temperature. The author's observations have led him to the conclusion that the melting point is certainly not constant; but they have enabled him to perceive that this alkaloid does not melt much below 230° C., and at that temperature it undergoes decomposition.

Respecting Mr. Armitage's test, while he admits the delicacy of it, he considers the conclusions incorrect. Instead of a reduction of the iron compound, a ferrocyanide of pseudo-morphine is formed, and this produces the reaction with the ferric chloride previously added.—Pharm. Jour. and Trans., March 24, 1888, 801.

Morphine—Derivatives.—Messrs. D. B. Dott and Ralph Stockman communicate the results of chemical and pharmacological experiments made with certain derivatives of morphine. The first of these,

Methylmorphine (Codeine), $C_{17}H_{18}(CH_3)NO_3$, was obtained both naturally (from Turkey opium in the usual way), and artificially (by the action of morphinate of sodium on methylchloride, extraction by chloroform, etc.), and the two substances were found to be completely identical, not alone in their chemical characteristics but also in their physiological action.

Dimethylmorphine, $C_{17}H_{17}(CH_3)_2NO_3$, first obtained by Hesse, was obtained most abundantly by warming together equivalent quantities of morphine, soda and methyliodide, cooling, introducing additional equivalents of soda and methyliodide, and digesting on a water bath. After evaporating the alcohol completely, the solution was exhausted with chloroform, the latter evaporated, the residue converted into hydrochloride, and the salt purified by several recrystallizations. The hydrochloride constitutes 4-sided prisms containing 4 mol. of water.

Ethylmorphine, $C_{17}H_{18}(C_2H_5)NO_3$, was obtained by the action of morphinate of sodium or ethyliodide in a similar manner to the above. The hydrochloride is obtained in minute, colorless, prismatic crystals, containing 6 mol. of water. Physiologically its action is identical with that of methylmorphine.

Diethylmorphine, $C_{17}H_{17}(C_2H_5)_2N_2O_3$, the authors did not succeed in preparing. The authors also prepared the

Acetylmorphine, $C_{17}H_{18}(C_2H_3O)NO_3$, first described by Wright, who named it "diacetylmorphine." Their process is essentially that of Wright. Physiologically it appears to be more active than either the ethyl or methyl substitution compounds.—Yearbook of Pharm., 1887, 538–547.

Morphine Salts—Decomposition of their Solutions on Keeping.—In reply to a query respecting the alleged production of "apomorphine" in a three per cent. solution of hydrochlorate of morphine, Dr. R. G. Eccles observes that a complete answer could not be given within a single year, as the samples producing the emetic results complained of were not submitted for examination. His experiments, however, point out that apomorphine was not formed in the solutions submitted by him to the test of keeping. Nevertheless, a change does occur on keeping solutions of morphine salts, beginning in a few weeks, as manifested by an alteration of color, and after four months crystals were observed to form, the formation keeping up until the date of their last examination, while the solution also becomes darker with the advance of time. The substance crystallizing out resembles alkaloidal morphine in a somewhat modified form, but may be a new and hitherto unreported decomposition product of an alkaloidal character. The most remarkable observation, respecting the solution of the hydrochlorate, is that the hydrochloric acid is no longer evidenced by reagents, while the solution remains neutral to litmus to the last.—Proc. N. Y. State Pharm. Assoc., 1888, 182–184.

Morphine Sulphate—Presence of Free Acid and Calcium Sulphate.—Mr. J. Geo. Spenzer draws attention to the presence of sulphate of calcium in different samples of sulphate of morphine. One sample of foreign make, characterized by the irritant effect of its solutions when applied hypodermically, was found to contain free acid in addition to sulphate of calcium. —Pharm. Era, July 1887. 249; from Proc. Ohio State Pharm. Assoc., 1887.

Morphine Hydriodate—Composition, etc.—Dr. Hermann Kunz, in the course of experiments made to determine the nature of a precipitate formed in a prescription composed of 0.10 g. morphine hydrochlor.; 5.0 g. potass. iodide, and 30.0 g. wine of colchicum, obtained a crystalline hydriodate of morphine containing 1 mol. of water of crystallization. Mr. H. R. Bauer had previously described a salt containing 3 mol., and E. Schmidt had obtained an hydriodate, in long, silky, glistening needles, containing

2 mol. of water. Dr. Kunz obtained his compound by mixing solutions of the calculated quantities of hydrochlorate of morphine and iodide of potassium, when upon standing for a greater or less time, according to the degree of concentration, the compound in question separates in the form of a fine crystalline deposit. These are washed with water, recrystallized from absolute alcohol, and finally again from hot water. The hydriodate is readily soluble in alcohol, very sparingly in cold water, but somewhat more easily in hot water.

Morphine Hydrobromate may be obtained in an analogous manner by double decomposition between hydrochlorate of morphine and bromide of potassium. Owing to the very sparing solubility of these two morphine compounds in water, the author considers it inadvisable to dispense morphia salts with either bromide or iodide of potassium whenever this can be avoided, and in cases where it is necessary, to direct that the mixture sbe well shaken before use.—Arch. d. Pharm., April 1, 1888, 307–311.

Phthalate of Morphine—Preparation and Therapeutic Value.—Mr. E. Bombelon recommends phthalate of morphine as the morphine salt that best fulfils the requirements of the physician. It is more soluble in water than the morphine salts of the mineral acids, and the solutions keep for a long time, even when very dilute. To obtain the salt hydrochlorate of morphine is precipitated with ammonia, the precipitate is washed and pressed, dissolved in acetic acid, and again precipitated with ammonia, and washed and pressed as before. The purified morphia so obtained is added in small quantities at a time to a hot solution of *absolutely pure* phthalic acid as long as it is dissolved, taking care to add a slight excess of morphine. The cooled solution is filtered, evaporated at a gentle heat to the consistence of syrup, and poured upon glass plates to dry and scale. The necessity for absolutely pure acid and alkaloid is obvious. One part of the salt is soluble in five parts of water. The solutions are perfectly neutral, and do not produce pain when used hypodermically.—Pharm. Ztg., 1887, 488.

Narceine—Melting Point, etc., of the Pure Alkaloid.—Messrs. Claus and Meixner have subjected a product obtained during some experiments on certain addition products of narceine, and supposed by them to be a new base, to nearer examination, and found it to be simply pure narceine. The substance has, however, a higher melting point than is given for narceine, since it melts at 162° C. instead of 145°. In all other respects the narceine corresponds to the character attributed to it. They believe that commercial narceine contains some other substances in small quantities, which lower its melting point. These substances are more readily oxidizable than the narceine itself, since the pure narceine, having the higher melting point, is readily obtainable by treating commercial narceine with nearly an equal quantity of permanganate of potassium, and sufficient dilute sulphuric acid to effect decomposition. A slight loss of narceine, however, occurs by this treatment.—Pharm. Jour. and Trans., Jan. 28, 1888, 621; from Jour. prakt. Chem., xxxvii. 1.

Cryptopine—Preparation.—Dr. E. Kauder has had opportunity to prepare the peculiar gelatinizing alkaloid of opium among other rare alkaloids of that drug, large quantities of material being at his command. From one lot of 5000 pounds of opium he obtained 3 pounds of crude muriate of cryptopine. To prepare *muriate of cryptopine* in a pure condition, the mother liquor, from which codeine, narceine, thebaine, and papaverine have been separated in the usual manner, is treated with excess of caustic soda, the resulting precipitate washed with hot water, and dissolved by hydrochloric acid. The solution, upon cooling, soon forms a gelatinous mass, which, upon standing for two or three days, changes into very soft crystals, that appear to float in the dark liquor. Excess of hydrochloric acid sometimes accelerates this crystallization. The crude salt is collected on a filter, pressed, purified by crystallization from hot water, and passing the hot solution through charcoal. The liquor, upon cooling, gelatinizes and crystallizes in the manner described by T. and H. Smith (see Proceedings 1887, 316). These crystals, upon being dried, shrink together, forming a horn-like substance. To obtain a more satisfactory product the salt is dissolved in hot spirit, from which it crystallizes in beautiful soft masses *without any gelatinous* character. The salt also shrinks together, but does not form a horny mass. The crystalline character is clearly recognizable when the salt—which is now white and perfectly pure—is put in water. The author has prepared and describes some other salts of cryptopine.—See Yearbook of Pharm., 1887, 479–485.

Quinine Sulphate—Presence and Separation of Cinchonidine and of Hydroquinine from a Commercial Sample.—Dr. De Vrij has examined a sample of quinine sulphate, manufactured by a prominent continental firm, by the optical test, and finding it to contain apparently a large quantity of cinchonidine, surmised that the salt might possibly contain hydroquinine, and subjected it to further examination. By a direct method, he separated an amount of bisulphate of cinchonidine (7.8 per cent.) corresponding to 5.87 per cent. of crystallized sulphate, or 4.36 per cent. alkaloidal cinchonidine. He has also separated some hydroquinine—the quantity is not stated—by a method based upon the following principles:

1. The slight solubility of cinchonidine in ether.
2. The copious solubility of quinine and of hydroquinine in ether.
3. The slight solubility of quinine chromate in water, 1 part in 2645 parts at 15° C.
4. The greater solubility of hydroquinine chromate in water, 1 part in 663 parts at 15° C.

5. The capability of water solutions of quinine and hydroquinine chromates to bear a temperature of ebullition without decomposition of these salts.

6. The liability of cinchonine chromate to decompose when its water solution is heated above 40° C., together with the greater solubility of this salt, 1 part in 250 parts at 15° C.

The author's experiments are given in minute detail. He adds, that

Hydroquinine chromate differs from quinine chromate in being copiously soluble in chloroform, while quinine chromate is only dissolved with difficulty in that liquid. Unfortunately, these two chromates, which are so stable in watery solutions, soon undergo decomposition when dissolved in chloroform, so that, although chloroform may be used to distinguish them, it will not serve for their separation.—Pharm. Jour. and Trans., Aug. 13, 1887, 133–135; from Moniteur Scientifique, July 1887.

Sulphate of Quinine—Ammonia Test Satisfactory.—Drs. G. Kerner and A. Weller, in continuation of their former paper (see Proceedings 1887, 323) in which they had discussed the availability of the "optical method" to the determination of foreign cinchona alkaloids in commercial sulphate of quinine, communicate the results of their very exhaustive experiments since made to determine whether or not the ammonia test, originally suggested by one of them (Dr. Kerner), and adopted by several Pharmacopœias, is sufficiently reliable for the purpose. The results of their studies convince them that the method is perfectly reliable, and particularly so in the following slightly modified form:

"The sample of sulphate of quinine is allowed to effloresce completely in a warm place at a temperature of 40°-50° C.; 2 grams of it, with 20 grams of distilled water in a suitable reagent glass, are kept in a water-bath at 60°–65° C., with frequent and vigorous shaking, for one-half hour. The glass is then placed in water at 15° C. and frequently shaken during 2 hours. The liquid is then filtered off, observing that the temperature of the water-bath shall be exactly 15° C. 5 c.cm. of the filtrate are placed in a test tube, and ammonia water of s. g. .960 is added until the precipitated quinine is again just dissolved and a clear solution formed. The quantity of ammonia must not exceed —? c.cm."

The authors leave it an open question what this quantity shall be. The quantity necessary has been determined by them to be for chemically pure sulphate of quinine, 3.4 to 3.5 c.cm.; for an admixture of 3 per cent. pure sulphate of cinchonidine, 4 c.cm.; for a mixture containing 7 per cent. sulphate of cinchonidine, 6 c.cm. in round numbers. These figures apply, however, to *pure* sulphate of quinine and its admixture with *pure* sulphate of cinchonine, and they require some modification in their application to the commercial salt, which may contain other alkaloid-salts, notably "hydroquinine." The authors have extended their experiments to the determination of

Hydroquinine in Commercial Sulphate of Quinine.—They find that when the test is applied to pure sulphate of quinine, which is simply admixed with 5 per cent. of pure sulphate of hydroquinine, 14.40 c.cm. of ammonia water (s. g. .960) are required to ensure a clear liquid; but if a mixture of the two salts in the same proportion is boiled, the two salts unite to form a double salt, and then only 4 c.cm. of ammonia water is necessary, while in the presence of 10 per cent. of sulphate of hydroquinine, as a double salt, 6.5 c.c.m. of ammonia water are necessary to reproduce a clear solution. These observations show that the presence of hydroquinine is quite as readily detected as that of cinchonidine, its influence on the reaction being about the same. In view of the fact that hydroquinine is often a component of commercial sulphate of quinine, this must show itself in making the ammonia test with the commercial salt, as is evident from the high titre—more than 7 c.cm.—shown by even the better samples. It cannot, therefore, be a great error to make an allowance in such cases of 1½–2 c.cm. for the hydroquinine present, which, being so more nearly related to quinine, can be regarded as being less of an impurity than cinchonidine.—Arch. d. Pharm., Aug. 1887, 712–738.

In a furtherc ommunication the authors reviewed: (1) Kerner's method, depending on the same relations of the alkaloids to ammonia; (2) Hesse's ether-test; (3) De Vrij's chromate-test; (4) Schäfer's oxalate-test; and (5) De Vrij's bisulphate-test. None of them lead to as satisfactory results and are as convenient as the ammonia test, which, in its above given modified form, is calculated to answer all requirements necessary for the determination of the commercial purity of sulphate of quinine. They admit, however, that no method yet proposed is absolutely exact, and that in this direction quinine testing is still an unsolved problem.—Ibid., Sept. 1, 1887, 749–765.

Sulphate of Quinine—Oxalate Test vs. Ammonia Test.—Dr. Louis Schäfer, referring to the above paper of Messrs. Kerner and Weller, criticises their conclusions unfavorably. His experiments lead him to the belief that the tendency of sulphate of cinchonine to form a double salt with sulphate of quinine may prevent its entering into solution under the conditions of the "ammonia test," and calls attention to other faults which render the latter test unsuited if accurate and reliable results are desired. An accurate test for the purity of quinine requires either a wider scope in the solubility differences of the salts, or an inferior tendency of them to form double salts. The latter is the case with the oxalates of the two alkaloids, and the author reviews his "oxalate test" (see Proceedings 1887, 521), and sees no reason why he should change his opinion respecting it. Its great advantages consist in its convenience, celerity, accuracy, and reliability, not to speak of the sharply-defined end of the reaction. Moreover, the "oxalate test" can be applied to the detection of foreign cinchona alkaloids in other neutral quinine salts, such as the hydrochlorate, hydrobromate, or valerianate. The only modification necessary is to use the molecular quantity of these salts corresponding to 1 gm. cryst. sulphate of quinine, viz., 0.90 gm. hydrochlorate, 1.02 gm. hydrobromate, and 0.97 gm. valerianate of quinine, the process being in all other respects conducted as for sulphate.—Arch. d. Pharm., Dec. 1, 1887, 1033–1041.

Sulphate of Quinine—Value of the Oxalate Test.—In the judgment of Messrs. C. F. Boehringer and Sons, the recent discussions on the respective merits of the different tests proposed to ascertain the purity of commercial sulphate of quinine, have shown that none of them can equal in accuracy or sharpness, the oxalate test (see Proceedings 1887, 319–320), if conducted in the following manner: Put 1 gm. of commercial sulphate of quinine (or 0.85 gm. of the completely dried sulphate) into a small tared flask, and dissolve it by means of 35 c.c. of distilled water at a boiling temperature. Next add a solution of 0.3 gm. of neutral crystallized oxalate of potassium in 5 c.c. of distilled water, and then add enough water to make the contents of the flask weigh 41.3 gm. Transfer the flask to a water-bath kept at a temperature of 20° C. (=68° F.), shake it occasionally, filter after half an hour through glass wool, and to 10 c.c. of the filtrate, add 1 drop of solution of soda (s. g. 1.160). No turbidity should occur in the course of a few minutes, if the sulphate was pure. —Amer. Drug., May 1888, 92.

Neutral (Bi-)Hydrochlorate of Quinine—Preparation and Advantage for Hypodermic Use, etc.—Mr. Clermont observes that the *neutral* hydrochlorate of quinine has a great advantage over the *basic* hydrochlorate, being soluble in its weight of water. To make it, the author dissolves in distilled water, 1 eq. (548 gm.) neutral sulphate of quinine, and mixes this with a solution of 2 eq. (208 gm.) of dried chloride of barium. After separating the sulphate of barium, the liquor is evaporated (below 100°), leaving the solid neutral hydrochlorate of quinine. The solution of this salt is, of course, bitter, but it is entirely free from any caustic quality, thus making it as desirable for hypodermic use as it is for delicate conditions of the stomach.—Amer. Jour. Pharm., Aug. 1887, 400; from Compt. Rend., 1887.

Hydrobromate of Quinine—Solubility of the Officinal Salt.—Dr. E. R. Squibb draws attention to the fact that the hydrobromate of quinine, as defined by the U. S. Pharmacopœia, is according to the formulas and all of its characters, except that of solubility, the neutral salt. It is described as being soluble in 16 parts of water, but is really soluble only in about 53 parts. The acid salt, which contains 2 mol. of hydrobromic acid to 1 mol. of quinine, requires 6 parts of water, and there appears to be no salt of intermediate solubility, nor has he been able to obtain such by his experiments.—Ephemeris, June 1888, 106–109.

Quinine—Suitable Vehicle for Disguising.—Mr. P. E. Hommell discusses the subject of disguising the taste of quinine in mixtures. He observes that a vehicle which will completely destroy the bitter taste of this important alkaloid without abstracting some of its therapeutic virtues is very hard to obtain. In his experience licorice is the best and most reliable, and he communicates formulas for an aromatized licorice syrup, aromatized licorice elixir, and aromatized licorice honey, which will be found under their proper headings, under "Pharmacy," in this report. The author has dispensed these with the approval of the physicians in his locality.—Proc. N. J. Pharm. Assoc., 1888, 84–86.

Sulphate of Quinidine—Growing Scarcity.—Sulphate of quinidine, at one time almost a drug in the market, at other times in considerable demand, and justly esteemed as being practically equivalent to quinine in therapeutic value, is becoming more and more scarce, because manufacturers of quinine at the present time use Javanese or East Indian barks almost exclusively, and these contain either no quinidine at all, or so little of it, that its separation does not pay.—Amer. Drug., June 1888, 107.

Cinchonine—Derivatives.—Messrs. Jungfleisch and Leger have studied the action of sulphuric acid and heat on cinchonine. Pasteur had discovered long ago that cinchonine and cinchonidine are by this action converted into isomeric alkaloids (cinchonicine, etc.) The authors find now that no less than six distinct bases are produced from cinchonine by continuing the action a sufficient time. They boiled one part of sulphate of cinchonine with a mixture of two parts of sulphuric acid and two parts of water, forty-eight hours in a flask with a return condenser. At the end of that time they found that there was neither cinchonine nor cinchonicine present, but there were four bases isomeric with them and two others containing an additional oxygen atom, all being capable of forming crystallizable salts. These alkaloids they describe as follows:

1. *Cinchonibine*, insoluble in ether, crystallizing from alcohol in small prismatic needles. The succinate is only slightly soluble in water, and forms large crystals. In alcoholic solution 0.75 per cent. turns the polarized ray 175.8° to the right.

2. *Cinchonifine*, insoluble in ether, crystallizing from boiling alcohol in strongly refracting needles. The succinate is readily soluble and crystallizes in needles. Alcoholic solution 0.75 per cent. turns the polarized ray 195° to the right.

3. *Cinchonigine*, crystallizes from ether in beautiful highly refracting prisms, and forms a crystallizable hydrochlorate which is but little soluble in cold water. Alcoholic solution 1 per cent. turns the polarized ray 60.1° to the left.

4. *Cinchoniline*, separates from ethereal solution in large crystals, but

forms a soluble hydrochlorate and an insoluble dihydriodate. Alcoholic solution, 1 per cent. turns the polarized ray 53.2° to the right.

5. *α-Oxycinchonine*, insoluble in ether, soluble in dilute alcohol, crystallizing in prismatic needles, remarkable for the sparing solubility of its salts with hydrogen acids. In alcoholic solution, 1 per cent. turns the polarized ray 182.56° to the right.

6. *β Oxycinchonine*, insoluble in ether, soluble in dilute alcohol, crystallizing in needles, forms readily soluble salts with the hydrogen acids. Succinate sparingly soluble. Alcoholic solution 1 per cent. turns the polarized ray 187.14° to the right.

The first four alkaloids have the composition $C_{19}H_{22}N_2O$; the last two contain two oxygen atoms instead of one.—Pharm. Era, May 1888, 177; from Compt. Rend., 1887.

Vieirine—Alkaloid from Remijia Vellozii, D. C.—The alkaloid from *Remijia Vellozii*, D. C., one of the cuprea barks, which stand in close relationship to the cinchonas, is now an article of commerce. It has been used as a febrifuge.—Amer. Drugg., May 1888, 83.

Aconitine—New Process of Preparation.—Mr. John Williams, in continuation of his experiments upon aconitine (see Proceedings 1887, 327–328), communicates a new process for its preparation by which he secures, as he believes, a larger yield of the alkaloid. The coarsely ground dried root of *Aconitum Napellus* is exhausted with amylic alcohol, the amylic alcohol solution shaken with dilute acid and water, the acid liquid precipitated with carbonate of soda, and the crude alkaloid thus produced is dissolved in ether or alcohol, and allowed to crystallize, when the pure alkaloid is obtained. Several precautions are necessary to secure a satisfactory result, to which attention is drawn in some detail. The author suggests that the Pharmacopœia (Brit.) should recognize the crystallized alkaloid in the place of the amorphous one now recognized as official.—Yearbook of Pharm., 1887, 442–447.

Aconitine—Fallacy of Color Reactions.—Various authorities have described certain color reactions which were said to be obtained by treating aconitine with different reagents, such as phosphoric acid, sulphuric acid with sugar, phospho-molybdic acid and ammonia, etc. Mr. A. Jürgens has recently made experiments which show that *pure aconitine does not yield any color reactions at all.* The only reliable test of the identity of aconitine is its physiological effect. The author found the composition of pure aconitine to correspond to the formula $C_{33}H_{47}NO_{12}$. On evaporating the alkaloid from an ethereal solution, it crystallizes in anhydrous, columnar crystals.—Amer. Drugg., May 1888, 88; from Zeitsch. f. Anal. Chem.

Aconitine—Precaution in Dispensing.—See *Aconitine Granules* under "Pharmacy."

Alkaloids of Aconitum Lycoctonum—Decomposition by Heat.—Prof. Dragendorff states that recent investigations show the alkaloids lycaconitine and myoctonine, obtained from Aconitum Lycoctonum, to undergo decomposition at a temperature of 60° C., with the separation of a nitrogenous constituent. This fact may account for the material variations in the formula heretofore assigned these alkaloids, and would indicate that the remarkably high figures for nitrogen which have been given by some investigators are probably correct. Neither the bases nor their salts are crystallizable, and both the bases resemble curare in their physiological action. Dragendorff mentions that, according to Jürgens, aconitine can be converted into picraconitine, which appears to stand between aconitine and aconine, the difference between aconitine and picraconitine being one benzoyl residue, C_6H_5CO, while between aconitine and aconine it is two benzoyl residues. It has been ascertained, however, that in the decomposition of aconitine not only benzoyl groups, but a methyl residue, is split off.—Drugg. Circ., Nov. 1887, 249.

Atropine.—Localization in *Belladonna Root*, which see under "Materia Medica."

Atropine, Hyoscyamine and Hyoscine.—Components of *Scopolia japonica*, which see under "Materia Medica."

Bromhydrate of Hyoscine—Physiological Action.—Dr. Hugenschmidt gives the results of trials of bromhydrate of hyoscine in his private practice. He used a solution of bromhydrate hyoscine, five cgm.; distilled water, thirty gm. Of this, six drops diluted with water and ingested, produced at the end of a half hour: visual troubles; a sensation of torsion in the ocular globes; dryness of the mouth and throat, and dilatation of the pupil. In one hour there was a sense of general fatigue, followed by a deep sleep with irregular respiration. During this time the pulse fell from seventy-two to forty-eight, and he observed in all his trials that the pulse constantly fell to forty-five or fifty. The sphygmograph indicated great augmentation of arterial tension, but a notable irregularity of heart beat was present. Five or six drops upon the tongue produced the same symptoms, with nausea added, but no vomiting. Two drops in the eye dilated the pupil completely in five minutes, with loss of accommodation. Thirty-six hours afterward the pupil commenced to contract; accommodation was established on the third day. but dilatation did not end until the fifth or sixth. He noted that in dilatation, after *ingestion*, the right pupil was much more dilated than the left.—Amer. Jour. Pharm., Dec. 1887, 612; from Nouv. Remèdes, Nov. 8, 1887.

Duboisine—Identity of the Article of Commerce with Hyoscine.—In a former investigation Mr. A. Ladenburg had recognized duboisine to be impure hyoscyamine. He has, together with Mr. F. Petersen, re-examined commercial duboisine, as now found in the market, and obtained a double gold salt which, when purified by several crystallizations, possessed all the characters of the corresponding hyoscine compound. They explain the difference of the two series of observations in the variation in the present mode of preparing duboisine from that pursued formerly, though they do not know how it is at present prepared.—Arch. d. Phar., August 1887, 739; from Ber. der D. Chem. Ges., xx., 1661.

Solanine—Chemical Characters, etc.—As the result of extended study, Dr. Gaignard arrives at the following conclusions: 1. Solanine is a glucoside which does not combine with acids to form salts; under the influence of acids it decomposes into solanidine and glucose. 2. It is absolutely insoluble in water, without it be strongly acidulated, and is sparingly soluble in alcohol, ether and the oils. 3. Solanine cannot be used in hypodermic injections, the acid solutions being too caustic. Maintained in suspension in a convenient vehicle, its own action is still more caustic. It is therefore necessary to use pills, and these should contain 10 to 20 centigrammes. The daily dose of 30 to 40 centigrammes is very well supported by patients. 4. Despite the opinion of writers who have studied this substance, we believe that it should not be classed among our best analgesics. 5. Its high price, its want of uniformity of action, and the high doses that it is necessary to prescribe, do not permit us to counsel its use as an analgesic.—Amer. Jour. Phar., Sept. 1887, 443; from Bull. Gén. de Thérap., July 15, 1887.

Scopoline.—A mixture of several mydriatic alkaloids. See *Scopolia japonica*, under "Materia Medica."

Cocaine—Constitution.—The experiments of Mr. Einhorn throw some further light upon the constitution of cocaine, its derivative and decomposition products. Having determined a carboxyl group in "anhydroecgonine," he inferred that one must be present in "benzoylecgonine," and that the alkyl derivatives of the latter—cocaine and its homologues—are therefore ethers, which would be formed by passing hydrochloric acid through the solution of benzoylecgonine in the corresponding alcohol. This was confirmed by experiment, and homologues of cocaine were prepared in this way. Working in the reverse direction, it was found that the most considerable product of the oxidation of ecgonine is succinic acid, of which more than half the weight of the ecgonine used was readily obtained.—Pharm. Jour. and Trans., March 3, 1888, 742; from Ber. d. D. Chem. Ges., xxi., 47.

Cocaine—Higher Homologues.—Prof. Frederick G. Nevy has prepared several higher homologues of cocaine by methods similar to that by which W. Merck (1885) first obtained æthyl-benzoylecgonine. Cocaine is the methyl ether of benzoylecgonine, or, as the author proposes to call it,

Methylbenzoylecgonine.—Benzoylecgonine does not occur naturally, but is obtained readily by the saponification of cocaine, and when treated with aethyliodide and aethyl alcohol in a sealed tube at 100°C., readily yields

Aethylbenzoylecgonine, which by appropriate treatment is obtained in white, silky-glistening crystalline masses, or larger monoclinic prisms resembling cocaine, which melt at 107° to 108°C., congeal at 90°C. and readily form crystalline salts. Its physiological action is the same as that of cocaine.

Monobromethylbenzoylecgonine is obtained by treating benzoylecgonine with aethylene bromide and aethyl alcohol in a similar manner. It was obtained in form of a colorless syrup, and its hydrochlorate appears to be likewise uncrystallizable. Its reactions are in the main the same as those of aethylbenzoylecgonine.

Propylbenzoylecgonine is obtained by the above treatment of benzoylecgonine, propyliodide and propylalcohol. It constitutes colorless prisms or silky needles, from alcoholic solutions also flattened prisms; melts at 78° to 79° C., and congeals again at 65°. It readily forms salts, is quite bitter, and in its action powerfully anaesthetic.

Isobutylbenzoylecgonine is obtained like the above by heating benzoylecgonine with isobutyliodide. It is obtainable in colorless prisms, which melt at 61°–62° C. It is intensely bitter, has powerful anæsthetic properties, and forms a hydrochloride which shows some evidence of crystallization. Its reactions are the same as those of cocaine and the other homologues.—Pharm. Rundschau, Sept. 1887, 208–209.

Cocaine—Conditions of Change into Amorphous Alkaloid.—Mr. Frederick G. Nevy has made some experiments with a view to determine under what conditions the amorphous alkaloid, known by the names of *cocaicine* and *cocainoidine*, resulting as a by-product in the manufacture of cocaine, is formed. His conclusions are as follows:

1. Cocaine hydrochloride when heated alone from 3 to 12 hours at 50° C. is not rendered amorphous, but crystallizes afterward readily and completely.

2. Cocaine hydrochloride heated with water or alcohol for 3 to 12 hours at 50°C. suffers a slight decomposition, with the formation of a little amorphous substance, the greater portion of the salt recrystallizing in the usual manner from alcohol.

3. Cocaine hydrochloride heated with dilute mineral acids, such as hydrochloric and sulphuric, under the same conditions as the preceding, is almost entirely rendered amorphous, so that very little crystalline residue is deposited from alcoholic solution.

4. Cocaine hydrochloride, heated with sodium carbonate and a little water from 3 to 12 hours at 50° C., is very largely changed into an amorphous condition.

5. Cocaine heated with boiling water readily splits up into ecgonine and benzoylecgonine.

6. Cocaine in contact with water at the ordinary temperature suffers decomposition, and the products formed are soluble in water. Their hydrochloride is amorphous.

7. A mixture of benzoylecgonine hydrochloride and cocaine hydrochlorides is difficultly crystallizable, especially when the per cent. of cocaine is small. A mixture containing 20 per cent. of cocaine hydrochloride still retains its syrupy condition. A mixture of equal parts of the free alkaloids remains amorphous for some time when exposed to the air, but over sulphuric acid it gradually solidifies into a hard, transparent, non-crystalline amorphous mass, free from crystals.

From these experiments it would seem that the amorphous alkaloids (cocaicine and cocainoidine) are not distinct substances, but are *decomposition products* (benzoylecgonine and perhaps ecgonine hydrochlorides) containing a little cocaine hydrochloride in solution.

In conclusion, the author remarks that Stockman has lately put forward the view that the amorphous alkaloid is a mixture of hygrine and cocaine.—West. Drugg., Oct. 1, 1887, 336–337; from Proc. Mich. Pharm. Assoc., 1887.

Amorphous Cocaine—Presence of a New Base.—Mr. O. Hesse states that his observations respecting the cause of the non-crystallinity of amorphous cocaine do not agree with those of Stockman (See Proceedings 1887, 329), who believed the non-crystallinity to be due to the presence of hygrine. It is evident that the amorphous material is not homogeneous, and he has succeeded in separating a distinct base, to which he assigns the name

Cocamine.—This has the same empyrical formula as cocaine, viz., $C_{17}H_{21}NO_4$. It dissolves readily in alcohol, ether or chloroform. It is with difficulty soluble in petroleum spirit and in water, but readily in dilute acids. The base, as well as its hydrochlorate, is amorphous. The basic product formed by its decomposition does not appear to be ecgonine.—Pharm. Jour. and Trans., July 23, 1887, 71–72; from Phar. Ztg., July 16, 1887.

Amorphous Cocaine—Question of Existence.—Mr. W. C. Howard observes that he was led to doubt the existence of amorphous cocaine for various reasons. By suitable treatment he obtained the alkaloids of coca leaves in the form of platinum double salts, a portion of which were soluble, and contained the cocaine as basic constituent, whilst the insoluble portion contained as basic constituent an amorphous alkaloid, constituting a thick fluid, which did not have the smell of trimethylamine nor formed a crystalline hydrochlorate: characters attributed by Lossen to "hygrine." Neither was its platinum salt decomposed by heating its solution. Mr. Howard is of the opinion that either Lossen's base (hygrine) was impure, or that his own base is a different one altogether. His analysis shows the base to contain three atoms more of carbon than cocaine. It is extremely bitter, and produces no numbing effect on the tongue. Amorphous cocaine, as far as he can judge, has no existence, but is a solution of cocaine in the base described by the author.—Pharm. Jour. and Trans., July 23, 1887, 71.

Amorphous Coca Alkaloid---Question of Existence.—Mr. O. Hesse maintains that an amorphous coca alkaloid does exist, the contradictory criticisms of others notwithstanding. Its properties render it likely that Howard's so-called "hygrine," the "cocainodine" of Lyons, and the "cocaicine" of Bender, are in the main the same substance. The author describes the process by which he has obtained the amorphous base, for which he proposes the name of

Cocaidine, and describes it as follows: Its composition is represented by the formula $C_{17}H_{22}NO_4$, yielding on analysis 67.2 per cent. carbon and 7.01 hydrogen, and it is therefore isomeric with cocaine and cocamine. It dissolves readily in ether, alcohol, acetone, chloroform, petroleum spirit, or benzene, but scarcely at all in water, ammonia solution or caustic soda; it has an alkaline reaction, but does not alter phenolphthalein. At first it appears to be tasteless, but gradually develops, after a rapidly disappearing sense of numbness in the tongue, a bitter taste. A chloroform solution gives in the polariscope with $p=4$ and $t=20°$ C. $(a)_D=-20.6$, so that it turns the plane of polarized light rather more strongly to the left than cocaine does. Cocaidine, when perfectly dried, attracts water from the atmosphere and then cakes together. It is free from odor and does not volatilize with water vapor. When boiled with an alcoholic solution of baryta it splits up, yielding benzoic acid, but what other product is then formed has not yet been ascertained.

Cocaidine hydrochlorate has the form of an almost colorless varnish, readily soluble in water or alcohol, and but slightly hygroscopic. It is without smell, tastes intensely bitter, and does not appear to produce irritation of the mucous membrane. The platinochloride has a composition represented by the formula $(C_{17}H_{21}NO_4)PtCl_6H_2+3H_2O$.—Pharm. Jour. and Trans., Nov. 26, 1887, 437; from Pharm. Ztg., No. 23, 1887.

Cocaine—Existence of an Amorphous Base.—Dr. B. H. Paul contributes a lengthy paper on cocaine, in which he discusses the observations made by different experimenters respecting the existence or non-existence of an amorphous alkaloid in coca. He has recently had opportunity to experiment with the crude cocaine now being extracted from coca leaves in South America, and found this to contain very variable quantities of crystallizable cocaine, together with more or less substances of an uncrystallizable nature. His results point very conclusively to the existence of an amorphous alkaloid in coca leaves, and that this is associated with some commercial samples of hydrochlorate of cocaine. Respecting the preparation of pure

Hydrochlorate of Cocaine, he observes that it is not practicable to attempt its purification by recrystallization from water or alcohol, on account of its great solubility and the consequent loss. It is far easier to purify the alkaloid itself by recrystallization from alcohol or ether ; and, having pure cocaine, it is easy to prepare the pure hydrochlorate. To determine the quality of the hydrochlorate, the author recommends precipitation of its solution in water by ammonia. The cocaine separates in minute crystals, and very little remains in solution, a solution of 1:800 giving a distinct precipitate.—Pharm. Jour. and Trans., March 17, 1888, 781–785.

Cocaine—Rapid Deterioration of its Solutions.—Dr. Armory Chapin calls attention to the rapid deterioration of solutions of cocaine, a day or so sufficing to make such appreciably weaker in anæsthetic power. He considers that this is the reason why, when cocaine is accomplishing such brilliant results for some who use it, others find its results often negative, and are therefore inclined to depreciate its good qualities. He regards it advisable to have the smallest requisite quantity of solution made at a time.—Drugg. Circ., Dec. 1887, 273 ; from N. Y. Med. Jour.

Cocaine—Dangers of its Use.—In continuation of some former observations concerning the dangers attending the administration of cocaine, Dr. I. B. Mattison reports on some forty cases observed by different physicians, in which the toxic effects of cocaine have been noted. From a consideration of these cases he re-affirms his conclusions that toxic effects from the use of cocaine are not rare, and that the toxic and lethal doses are very uncertain ; and he believes that the best antidotes are nitrite of amyl and hypodermic injections of morphine.—Drugg. Circ., Feb. 1888, 33.

Cocaine—Value as an Application to the Stings of Insects.—Dr. Tillot says that if the painful lesions, whether caused by bees, wasps, gnats, ants, or other insects, be treated with a strong solution of cocaine applied on cotton held in place with a bandage, the pain ceases at once, and there is no tumefaction. Dr. Tillot reports success in "a large number of cases."—Jour. de Med. et de Chir. Prat., Sept. 1887.

Crude Cocaine—Manufacture in Peru and Bolivia.—Mr. H. T. Pfeifer gives the following account of his process of manufacturing crude cocaine in Peru and Bolivia: The disintegrated coca leaves are digested at 70° C. in closed vessels for two hours with a very weak solution of sodium hydrate and petroleum (boiling between 200° and 250° C.). The mass is filtered, pressed while still tepid, and the filtrate allowed to stand until the oil has completely separated from the aqueous solution. The oil is then drawn off and carefully neutralized with very weak hydrochloric acid. A white, bulky precipitate of cocaine hydrochloride is obtained, together with an aqueous solution of the same compound, while the petroleum is free from the alkaloid, and may be used for the extraction of a fresh batch of leaves. The precipitate is dried, and by concentrating the aqueous solution a further quantity of the hydrochoride is obtained. Both can be shipped without the risk of decomposition. The product is not quite pure, but contains some hygrine, traces of gum, and other matters. The percentage of alkaloid is 75 per cent., while chemically pure hydrochloride of cocaine contains 80.6 per cent. of alkaloid. The process is applicable to the valuation of coca leaves, since the extraction of the leaves is complete.

The following are some of the results with different samples of coca leaves of various age:

Yield of cocaine, calculated from the weight of dry leaves:

Yungas, fresh green leaves	0.7 per cent.
Mapiri, 1 month old	0.5 "
Yungas, 1 month old	0.5 "
Mapiri and Yungas, 6 months old	0.4 "
Cusco (Peru) 6 months old	0.3 "
Mapiri and Yungas, 1 year old	0.2 "
Cusco, 1 year old	0.2 "
Mapiri and Yungas, 2 years old	0.15 "
Yungas and Cusco, 3 years old	not a trace.

—Amer. Drug., Jan. 1888, 7; from Chem. Ztg.

Hydrochlorate of Cocaine—Cost of Manufacture, Commercial Quality and Character of Impurities.—Dr. E. R. Squibb, with his usual thoroughness, gives an account of the manufacture, cost, commercial quality, reactions and character of impurities observed in hydrochlorate of cocaine. He prepared cocaine from 41,838 pounds of coca leaves, which yielded 922,917 grains of salt, calculated as hydrochlorate, or 22.05 grains per pound, at a cost of $11,707. The author observes that the appearance of the article of commerce has improved. He regards the chloroform-solubility test submitted by him in a former paper (see Proceedings 1887, 331), in the light of his further extended experience, to serve an excellent purpose for determining the quality of the commercial hydrochlorate of cocaine. In using the test, the chloroform must be of a definite high specific gravity of 1.490, and the salt must be first tested in its original market condition, and if found to be very soluble in this condition it must be dried, noting the proportion of moisture lost, and be then submitted to the solubility test. He finds that 0.4 gram of dry hydrochlorate will dissolve in 5 c.c. of chloroform of the above sp. gr.; if this salt is exposed to the air, it will absorb some moisture, and the original quantity—thus increased in weight—will then dissolve in much less chloroform: 2 c.c. in an instance given. Respecting amorphous cocaine or hygrine, the author, notwithstanding all that has been written on the subject, can find no evidence of either from his investigations of the products of the market. All of them, however, contain from 1 to as much as 2.5 per cent. of a sticky, odorless, neutral substance of a light-brown color and bitter taste, not irritant, and yielding the cocaine impression upon the tongue, probably because not completely freed from the salt of cocaine.—Ephemeris, Oct. 1887, 986–993.

Hydrochlorate of Cocaine—Test of Purity and Preparation.—Mr. John Williams recommends the following expeditious and reliable test for the purity of hydrochlorate of cocaine, which depends upon the almost absolute insolubility in ether, while all secondary salts (alkaloids) and impurities, even when present as hydrochlorate, appear to be soluble. The hydrochlorate of cocaine to be examined is dissolved in the smallest quantity of absolute alcohol, s. g. 0.795, six times the volume of pure ether is added, and the mixture, after shaking several times, is allowed to stand ten minutes or more, when the crystalline precipitate of the pure salt can be thrown on a small filter, squeezed, spread on blotting paper, dried completely and its weight ascertained. The method is admirably adapted for the purification of the salt. It must be remembered that in carrying out this operation both the alcohol and ether must be free from water. —Yearbook of Pharm., 1887, 502–504.

Hydrochlorate of Cocaine—Commercial Forms.—Mr. D. C. Robbins communicates the results of his examination of commercial forms of cocaine hydrochlorate. It is prepared for the market in various forms, to wit: In needle-formed crystals which resemble Epsom salt and contain 6 to 8 per cent. of water of crystallization. These crystals are very soluble and delicate in form, and are difficult to make of good appearance, while anhydrous crystals prepared by a solution in alcohol are easily prepared, and, not having any special form like the aqueous, can be mixed with a percentage of amorphous salt. The importance which has been attached to anhydrous crystals of cocaine as compared with aqueous is somewhat interesting when we consider that the difference in the amount of water contained in the two forms is usually about one-half of that contained in sulphate of morphine, and one-third of that in sulphate of quinine. The best form of cocaine is described by the author as follows: Pure crystallizable hydrochlorate of cocaine can be furnished in many forms, but the only form that requires a full separation of the amorphous salt is the needle-form aqueous crystal; and this form, which resembles Epsom salt, has not been favored by manufacturers because the anhydrous preparation can be more easily and profitably made. Without doubt, for solutions for permanence, and for all delicate operations, the salt employed should be as completely divested as possible from amorphous cocaine, and this is more assured in the aqueous needle-form crystals than in any other.—Drugg. Circ., Feb. 1888, 28–29.

Cocaine Chloromercurate—Preparation, Composition, etc.—Messrs. Balbiano and Tartuferi, in experimenting with the preparation known on the continent of Europe as "Sattler's Solution," which is prepared by adding 2 centigrams of mercuric chloride to a solution of 5 grams of hydrochlorate of cocaine in 100 grams of water, found that a definite double salt is formed and represented in that solution. It has the composition represented by the formula $C_{17}H_{22}NO_4Cl.HgCl_2$; constitutes a white crystalline powder, melting at 122.5°–123° C., and forming, upon cooling, a hard vitreous mass. It is only slightly soluble in cold water, 100 c.c. at 21° C. only taking up 0.536 gram, and still less in 5 per cent. solution of hydrochlorate of cocaine, 100 c.c. at 24° C. only dissolving 0.135 gram of the chloromercurate. Experiments made to test whether this compound confers antiseptic properties to the solution of cocaine have led the authors to the conclusion that in the proportion in which it is present in Sattler's solution (0.0425 per cent.) its influence as an antiseptic is negative.—Pharm. Jour. and Trans., Oct. 29, 1887, 357; from Ann. Chim. e di Farm., Sept. 1887, 157.

Phenol-Cocaine—Preparation and Use.—According to Mr. Vian, phenol-cocaine, prepared by gently heating phenol 1 with cocaine 2, is a valuable local anæsthetic, particularly recommendable for toothache. For this purpose it can be prepared extemporaneously by dissolving 0.03 cocaine pur. in 50.0 of a 2 per cent. solution carbolic acid.—Rundschau, Prag., 1887, p. 448.

Hygrine—Existence in Fresh Coca Leaves.—The existence of the alkaloid hygrine, discovered by Lossen, has recently been called in question, but both Howard and Hesse have procured it from cocaine mother-liquors, the latter having assigned to it the formula $C_{12}H_{13}N$, and thus regarding it as a homologue of chinoline. Mr. Stockman, while he found very little hygrine in dried coca leaves, has recently had an opportunity to examine a preparation made by Dr. Rusby from fresh coca leaves, and in this he found a notable proportion of this volatile alkaloid. He states that Dr. Rusby's preparation had an aromatic, pleasant taste, and produced a strongly stimulant effect. The alkaloid, as obtained by him, is a brown oily liquid, having a characteristic odor and burning taste. He characterizes the alkaloid as having strongly irritating properties, and that he found it to be fatal to frogs.—Pharm. Era, May 1888, 177.

Caffeine—Amount in Husks of Liberian Coffee and in the Pods of Cacao and Kola.—Messrs. Heckel and Schlagdenhauffen have determined the amount of caffeine in the husks of Liberian coffee, and the pods of cacao and of kola. While the kola seeds contain 2.371 per cent. of caffeine, their pods contain only about one-fortieth of that amount. The cacao pods contained only about one-thirtieth of the amount present in the seed, while Liberian coffee husks yielded only 6 milligrams per 100 grams. The caffeine, the authors find, exists in the free state in kola and Liberian coffee. The Liberian coffee husk gave off the odor of caffeine when roasted, but the leaves of the coffee plant and the leaves of kola, did not yield any caffeine.—Pharm. Jour. and Trans., June 30, 1888, 1086; from Rép. de Pharm., 1888, 205.

Caffeine—Action of Iodhydric Acid, etc.—The experiments of Mr. Max Wernecke show that the action of iodhydric acid upon caffeine is even more energetic than that of hydrochloric acid, beginning at a considerably lower temperature, but complete splitting up of caffeine is not ended until after heating for five or six hours at 175°. The products of the reaction, in the absence of phosphorus, are the same as those produced by the action of hydrochloric acid, viz., carbonic oxide, carbonic acid, formic acid, sarkosin, ammonia, and methylamin. In the presence of phosphorus, glycocoll is produced in place of sarkasin, and phosphoretted hydrogen and iodphosphonium are developed. *Æthylen bromide* has no action upon dry caffeine even at 200° C. *Iodide of ethyl* also forms only small quantities of the addition product—

Ethylcaffeine periodide, which is stated by Tilden to be obtained readily by heating the alkaloid with excess of the ether in sealed tubes at 130°. Neither could the author obtain an addition product with *phenylhydrazin.* Nor could a compound of chloride of iodine be obtained by the direct action of that body upon caffeine, but the formation of

Caffeine chloro-iodide is easily accomplished by dissolving caffeine in hydrochloric acid, sp. gr. 1.124, diluting with an equal volume of water, adding a concentrated solution of nitrite of sodium, and allowing a few crystals of iodide of potassium to drop into the effervescing fluid. The iodine at first separated re-dissolves, and after a short time crystals of hydrochlorate of caffeine chloroiodide are separated in form of brownish needles, which are deprived of mother-liquor by suction, and re-crystallized from 25 per cent. hydrochloric acid. When pure it forms golden-yellow needles or prisms, which when dry are not materially affected by light and melt at 182°–183°. By the action of ammonia unchanged caffeine may be regenerated from this compound, in which respect it differs from the analogous chinolin chloriodide, since by the same action on the latter an amido group takes the place of the chlorine atom.—Arch. d. Pharm., March 1888, 233–248.

Colchicine—Toxic Effects.—Mr. Houdé, while experimenting with crystallized colchicine, accidentally swallowed a quantity of a solution estimated to contain several centigrams of the active principle. He abstained from all treatment, and observed the effects. They were characteristic. Five hours after taking the colchicine he began to experience intense headache, with a feeling of heaviness on the stomach, which he compared to the pressure of a forty-pound weight. Vomiting next appeared, recurring fifteen times, and consisting successively of alimentary, mucous, and bilious matters. Alternating with these, violent purgings were experienced, repeated some twenty-five times during the night, and composed of semi-liquid, horribly fetid stools, preceded by colic and painful tenesmus. The whole was accompanied with profuse sweating, tremors, cold and numbness in the extremities. Finally, overcome with fatigue, and nearly swooning, the patient went to sleep. He felt very weak for several days, but recovered without treatment.—Drugg. Circ., Dec. 1887, 273.

Pilocarpine—Synthetical Production.—Messrs. Hardy and Calmels have succeeded in producing synthetically an alkaloid identical with pilocarpine. The starting point is *beta*-pyridine *alpha*-lactate, which was distilled with bisulphide of carbon and tribromide of phosphorus. The residue was treated with water, the solution saturated with baryta, the excess of baryta removed by carbonic acid, and the solution evaporated and dried at not exceeding 140° F. A crystalline double salt—$AuBr_4H.C_8H_8BrNO_2$—was obtained from this residue by treatment with hydrobromic acid and chloride of gold, from which the gold was removed by sulphuretted hydrogen, trimethylamine was added to the filtrate, and the mixture heated in sealed tubes to 302° F. for several hours. The contents of the tube having been evaporated to dryness, the residue was treated with an aqueous solution of carbonate of potassium, when an alkaloid was separated and recognized as *pilocarpidine*. The iodo-methylate of this base was oxidized by treatment with permanganate of silver and an alkaloid thus obtained which was identical with *pilocarpine* both in chemical composition and physiological action.—Phar. Era, Nov. 1887, 409; from Compt. Rend.

Pilocarpine—Inactivity of its Solutions after Keeping.—It is stated in "Pharm. Ztg." that several physicians in Berlin have from time to time been disappointed by solutions of hydrochlorate of pilocarpine displaying absolutely no action at all. At first it was suspected that mistakes or substitutions were at the bottom, but careful investigations showed that even the best looking hydrochlorate would all at once become inactive, for no reason at present explicable.—Drug. Circ., May 1888, 105.

Alkaloids of the Berberideaceæ—Investigations.—In continuation of his former investigations of the character of the Berberis alkaloids (see Proceedings 1887, 339), Prof. Ernst Schmidt reports the results of further investigations made by Dr. Friedrich Wilhelm. The first alkaloid considered is

Hydrastine, the history of which is reviewed, and the method employed for its preparation given in detail. The yield was about 1 per cent. It constitutes in the pure condition large, well-formed, colorless, shining rhombic prisms, which are insoluble in water and in petroleum benzin, but soluble in alcohol, ether, acetic ether, aceton, benzol, and chloroform, forming optically active solutions. The crystals are anhydrous, and, in agreement with the determination of Power, melt at 132°. The elementary analysis also agrees well with the formula $C_{22}H_{23}NO_6$, given by Mahla and confirmed by Power, but the analysis of the hydrastine salt and of its derivatives agree better with the formula of Eykmann, viz., $C_{21}H_{21}NO_6$, which the author accepts as correct. The author describes the auro-and platino-chloride of hydrastine, hydrastine ethyl chloride, hydrastine-ethylammonium hydroxide, as well as the products of the action of reducing agents. In conjunction with Prof. E. Schmidt also, he has studied the products of the oxidation of hydrastine: by manganic oxide and sulphuric acid; by platinic chloride; by permanganate of potassium in alkaline and in acid solution; and by chromic acid. The products of the oxidation of hydrastine are:

Hydrastinine and *Opianic Acid*, by the action of peroxide of manganese and sulphuric acid; by platinic chloride; by permanganate in acid solution, and by chromic acid; while

Hemipinic acid, *Nicotinic acid* and *Methylamine* are produced by the action of permanganate of potassium in alkaline solution; the last two possibly being the products of a second oxidation upon *hydrastinin* primarily formed.

The results show that there exists a close relationship between

Hydrastine and *Narcotine*, the former producing, by the action of oxidizing agents, *hydrastinine* and *opianic acid*, whilst narcotine produces under the same influence *cotarnine* and opianic acid. Respecting the third alkaloid of *hydrastin*,

Canadine, the authors have obtained a third alkaloidal substance, which is distinguished from hydrastine by its greater solubility in acetic ether and in absolute alcohol. It crystallizes from the former in radiating masses of crystals, from alcohol in the form of flat, faint yellow, warty crystals. Its melting point is 120°. The small quantity of this alkaloid obtained makes it necessary that further experiments be made to establish its identity with the *canadine* of Burt and Hale.—Arch. d. Pharm., April 1888, 329–365.

Alkaloid of Ergot—Modification of Process of Preparation.—The process for preparing the two alkaloids of ergot of rye, called by Wenzell "ergotine" and "ecboline," has been considerably improved by Bombelon. The first of these (ergotine) has been renamed by Tanret "ergotinine;" the second (ecboline) has been renamed by Kobert "cornutine." The process is as follows: Macerate for 24 hours at ordinary temperature 1,000 grams of ergot, previously deprived of oil and finely powdered, with sufficient alcohol (95 per cent.) containing 50 grams of pure soda, to completely cover the powder, shaking once in a while. Express the tincture, and macerate the residue with sufficient alcohol to cover, but without soda, for 24 hours; express again and add to the foregoing tincture, which now will contain all the sphacelic acid combined with sodium, besides ergotinin and cornutin; also some of the fatty matter, resin and extractive matter. Acidulate distinctly with citric acid, and distil off the alcohol. Add 200 grams of distilled water to the residue in the still; this will dissolve the citrates of the alkaloids, but not the sphacelic acid, which has been liberated. The remaining mass is transferred to a filter, and treated with 50 grams of alcohol (95 per cent.), which will dissolve nearly all of it. Neutralize the filtrate strongly with solution of soda, and add 50 grams of ether. Sphacelate of sodium, being insoluble in ether-alcohol, separates in jelly-like lumps, while the soap and resins remain dissolved. Transfer to a filter, wash the sodium salt with ether-alcohol, let it drain off, wrap the cake in filtering paper, and transfer to a press till thoroughly dry. The dry mass is yellowish and translucent, similar to white castile soap shavings, and is a resin soap, sphacelic acid being a true acid resin. The cake is powdered in a porcelain mortar and vigorously rubbed with an excess of acetic acid, which will set free the sphacelic acid. The latter is transferred to a filter, washed with distilled water to free it from acetate of sodium, and pressed dry between filtering paper. Sphacelic acid thus prepared is a light, nearly white powder, which becomes electric on rubbing. By repeated washings, dissolving in hot alcohol, and filtering through a hot water filter, it is obtained perfectly pure and of a snow-white color. It is insoluble in water, slightly so in ether, chloroform and bisulphide of carbon, more easily in cold, strong alcohol, still more so in hot alcohol. Being prone to decomposition it would be best to keep it as sphacelate of sodium. The perfectly clear, yellowish solution of the citrates of the alkaloids is supersaturated with carbonate of sodium, which liberates the alkaloids. By shaking repeatedly with ether, till the latter is not colored any longer, all the ergotinin will be taken up. The insoluble flakes which remain are cornutin. It is taken up by acetic ether or by chloroform.

Ergotine (Wenzell)—*Ergotinine* (Tanret)—appears as a light yellow, spongy mass, which never crystallizes. Bombelon thinks that the so-called crystallized ergotinin is a decomposition product obtained by the action of chemicals on ergot.

Ecboline (Wenzell)—*Cornutine* (Kobert)—forms an amorphous, reddish mass, which is changed to flesh-color on triturating; being perfectly insoluble in ether, it may be obtained pure by repeated treating with absolute ether. Bombelon much prefers phthalic acid to any other acid for combination with the alkaloids, because it is still more antiseptic than even salicylic acid.—Drug. Circ., May 1888, 106; from Pharm. Ztg.

Erythrophleine—A New Local Anæsthetic.—Dr. Lewin draws attention to a drug from Africa under the name of "hayab," which he believes to be derived from

Erythrophlœum judiciale, used as an ordeal poison on the west coast of Africa. He finds it to contain an alkaloid, *Erythrophleine*, which possesses powerful anaesthetic properties. The author's results of physiological experiments are detailed in Münch. Med. Wochenschrift, Jan. 17, 1888, 48. See also *E. judicale* under "Materia Medica."

Erythrophleine—Commercial Characters.—A nearer description of the alkaloid of *Erythrophlœum guineense* or *judiciale*, has not yet been given. As supplied by a reputable manufacturing firm in Europe, the hydrochlorate is described as occurring in form of a yellowish crystalline powder, which is completely soluble in water, forming clear solutions. Its solutions must be prepared fresh as wanted. Mr. B. Fischer draws attention to its possible adulteration with cocaine, and that therefore it should be procured only from the most reputable sources.—Arch. d. Pharm., March 1, 1888, 220; from Pharm. Ztg.

Erythrophleine—Non-Suitability as an Anæsthetic in Ophthalmology.—Professor Panas, in a communication to the Académie de Médicine, states, respecting erythropleine, that as a local anæsthetic in ophthalmology its action is more prolonged but less complete than with chloral, while the inflammation and pain which attend its use render it unsuitable for all eye operations; durable anæsthesia is obtained with chloral by repeating the instillations.—Amer. Jour. Pharm., May 1888, 238; from Prog. Méd., March 10, 1888.

Erythrophleine—Dispute Regarding its Anæsthetic Power.—The alleged anæsthetic power of erythrophleine (an alkaloid from *Erythrophlœum guineense*) has been the subject of considerable dispute. Contradictory to the observations of Dr. Lewin, who first brought the alkaloid to notice as a local anæsthetic, Prof. Liebreich has totally failed to secure any of the results claimed by Lewin; and exhibits, incidentally, some jealousy that the latter should have alluded to work of thirteen years ago, when that work was performed by him when a student under Liebreich. Insinuations are also made by the last-named gentleman that the investigation was undertaken in the "interests of commerce," an English house having a large quantity of erythrophlœum bark to dispose of. Dr. Tweedy, of England, and others, have also failed to observe the effects noted by Lewin from the use of the alkaloid. Again, on the other hand, several other surgeons have given strong testimony to the efficacy of the new rival of cocaine. These conflicting results may be due to impurities remaining in the alkaloid, or from unsuspected changes occurring after its separation.—Drugg. Circ., May 1888, 107.

Stenocarpine (Gleditschine)?—A Fraudulent Alkaloidal Compound.—Prof. F. G. Novy has subjected a solution labeled "2 per cent. Solution of

'Gleditschine'" to analysis. The history of this solution may be briefly stated as follows: In the New York Medical Record, July 30, 1887, Dr. J. H. Claiborne, Jr., called attention to a new local anaesthetic, which was claimed to have been discovered by Drs. Goodman and Seward in the leaves of a tree growing in Louisiana. This tree was claimed to resemble *Acacia stenocarpa*, and the substance claimed to be obtained from it, which is alkaloidal, was on this ground named *Stenocarpine.* The efforts of Dr. Claiborne to determine the source of the new alkaloid (?) finally led the alleged discoverers—Drs. Goodman and Seward—to produce some leaves, which have been identified to be the leaves of *Gleditschia triacanthos*, Lin., and the name of the alkaloidal substance was accordingly changed to "*Gleditschine.*" This was, however, not supplied in substance, but in the form of a so-called 2 per cent. solution, *it being claimed that the salt of the alkaloid was not permanent.* Prof. Knapp, who made some physiological experiments with this new substance, arrived at the conclusion "that the new local anæsthetic is very similar to cocaine, chiefly differing from it by its more powerful and lasting mydriatic property." Prof. Novy's analysis now reveals the fact *that the so-called stenocarpine or gleditschine is a fraudulent substance.* The solution, instead of containing 2 per cent. of alkaloidal substance, contains 5.81 per cent., and with the acids in combination amounts to 6.53 per cent. composed as follows:

Cocaine hydrochloride	6.00
Atropine sulphate	0.50
Salicylic acid	0.03

The latter is evidently added to the solution as a preservative.—Phar. Rundschau, Nov. 1887, 248–250.

The non-existence of an alkaloid in the leaves of *Gleditschia triacanthos*, Lin. (see under "Materia Medica") is clearly shown by the experiment of Prof. Carl Mohr.

Wrightine (*Conessine*)—*Characters, Compounds, etc.*—Dr. Herm. Warnecke, after reviewing the history of the alkaloid of the seeds of *Wrightia antidysenterica*, R. Br., originally called by Stenhouse "Wrightin," but afterwards by Prof. R. Haines, who obtained it from the bark of the tree known as conessi bark, "conessine," gives the details of the preparation of the pure alkaloid from a parcel of seeds recently imported into Hamburg, together with the exhaustive experiments made to determine its character and chemical relations. Dr. Warnecke prefers to retain the original name Wrightine for the alkaloid, and describes it as follows: It constitutes a voluminous mass of delicate, colorless, silky-glistening crystalline needles, having a strong alkaline reaction, an intensely bitter taste, are anhydrous, and, becoming yellow at 60° to 70° C., melt at 122° C. It is sparingly soluble in water, but readily in alcohol, ether, chloroform, petroleum ether, benzol, amyl-alcohol and bisulphide of carbon. The results of the ultimate analysis lead the author to the provisional formula $C_{24}H_{40}N_2$.

Hydrochlorate of Wrightine—$C_{24}H_{40}N_2(HCl)_2$—is a white, powdery substance, composed of microscopic crystalline needles, readily soluble in water and alcohol.

Nitrate of Wrightine—$C_{24}H_{40}N_2(HNO_3)_2$—constitutes a microscopic crystalline powder, while

Oxalate of Wrightine—$C_{24}H_{40}N_2.C_2H_2O_4$—is obtained from its alcoholic solution in microscopic, but well formed, flat, single crystals.

Besides the "conessine" of Haines, from the bark of *Wrightia antidysenterica*, there is another "conessine," which Dr. Faust obtained from the bark of the West African apocynaceæ—*Holarrhena africana*. The bark of this plant has been determined to be distinct from *Wrightia antidysenterica* by N. Wulfsberg. Nevertheless, the "conessine" obtained from it, which the author has had opportunity to prepare and examine, proves it to be identical with the wrightine above described. After giving the character of the reactions of wrightine with the different alkaloidal reagents and describing its characteristic reactions for identification, the author describes a characteristic oxidation product of the alkaloid

Oxywrightine. It is produced by the action of iodic acid upon the alkaloid as follows: 10 grams of wrightine are dissolved in 100 grams of 5 per cent. sulphuric acid, a solution of 5 grams of iodate of potassium in 150 grams of water is added, and the mixture allowed to stand in the dark. After 24 hours, the iodine that separates is removed by shaking out with chloroform, and ammonia is carefully added to the colorless aqueous liquid. A crystalline precipitate is obtained on standing, which is re-crystallized by solution in 800 grams alcohol and addition to this solution of about twice its volume of water. Oxywrightine forms colorless crystalline needles, which are coarser than those of wrightine, strongly alkaline and bitter, anhydrous, become yellowish by prolonged heating at 100° C., and above that point darker and darker, and melt at 294° C., forming a brown fluid. Its ultimate composition corresponds to the formula $C_{12}H_{21}NO$. The alkaloid is easily soluble in acids, with difficulty in bisulphide of carbon, ethyl-alcohol, chloroform, benzol and amyl-alcohol; very difficultly soluble in water, ether and petroleum ether; more soluble in methyl-alcohol than in ethyl-alcohol. The author has prepared and describes the platino chloride, the hydrochlorate, nitrate, sulphate and oxalate, as well as methyloxywrightine iodide, methyloxywrightine hydroxide and the platinum double salt of the latter. He also gives the character of its reactions with alkaloid reagents and characters of identity. Finally, he has made experiments to determine the changes which wrightine undergoes in the animal organism, which confirm his suppositions that in the animal economy both of carnivorous and herbivorous animals the wrightine is converted into oxywrightine.—Archiv. d Pharm., March 1888, 248–261, and April 1, 1888, 281–292.

Sparteine—Action in Cardiac Affections.—Dr. Malowsky has tested sparteine in three cardiac cases during the period of non-compensation. His conclusions are: That in moderate doses it stimulates cardiac activity, gives fullness to the pulse, and diminishes (by a few beats only) the number of pulsations; that it acts rapidly; that the rhythm does not become entirely regular; that an increased quantity of urine is eliminated, and that the medicament neither accumulates nor causes adventitious symptoms. Doses: one to three cgm. per dose, or ten cgm. per diem, of Merck's preparation.—Amer. Jour. Pharm., Dec. 1887, 612; from Bull. Gén. de Thérap., Oct. 30, 1887.

Pereirine Hydrochlorate—A Substitute for Quinine.—Dr. Ferreira (Brazil) highly recommends hydrochlorate of pereirine as a substitute for quinine in cases of malarial fever. To a child, who could not take quinine, had been given two doses of fifteen grains of the pereirine salt, half an hour apart, and after a repetition of like doses, the next day, rapid recovery took place, with no further attacks.—Amer. Jour. Pharm., Feb. 1888, 76; from Bull. Gén. de Thérap.

Arginine—A New Alkaloid from Lupinus Luteus, L.—Messrs. E. Schulze and E. Steiger have isolated an alkaloid from the germinated seeds of *Lupinus luteus*, L., which they name arginine. A hot water infusion of the dried and powdered cotyledons is mixed successively with tannin, lead acetate and lead subacetate, the filtrate freed from lead by sulphuric acid, again filtered and precipitated with phosphotungstic acid; the precipitate is mixed with lime and a little baryta; the filtrate freed from these bases by carbonic acid gas, is neutralized with nitric acid and evaporated to crystallization. The isolated base was not obtained in distinct crystals; it is easily soluble in water, insoluble in alcohol, has the composition $C_6H_{14}N_4O_2$, and readily absorbs carbonic acid, forming a crystallizable carbonate soluble in water. Most of the salts are readily soluble in water, and these solutions dissolve cupric hydrate, yielding crystallizable salts containing copper and arginine. The solutions of arginine salts are precipitated by phosphoantimonic acid, phosphotungstic acid, and potassio-bismuth iodide, but not by picric acid, tannin, or the double iodides of mercury or cadmium.—Amer. Jour. Pharm., Aug. 1887, 428.

Ephedrine Hydrochlorate—A New Mydriatic.—The crystalline alkaloid, ephedrine, from *Ephedra vulgaris*, var. *helvetica*, is now an article of commerce in the form of hydrochlorate. It occurs in colorless needles, soluble in 4 parts of water, and easily soluble in alcohol. It has mydriatic properties.—Amer. Drugg., May 1888, 83.

Lantanine—Antipyretic Value, etc.—This alkaloid (see Proc. 1887), from *Lantana brasiliensis*, is said to act upon the circulation, like quinine, to retard nutrition and lower the temperature. It is supported by the most delicate stomachs. According to Mr. Buiza (Lima), intermittent fevers, which are rebellious to quinine, give way to the influence of two grammes (*sic*) of lantanine. Its antipyretic powers are obtained by giving one or two grammes in twenty-four hours in pill form, each pill containing ten cgm. In intermittent fevers lantanine should be given immediately after the attack, and in ninety-nine cases out of one hundred, so says the author, it will not return. The medicament is given in pill form on account of its very bitter taste.—Amer. Jour. Pharm., Oct. 1887, 490; from Nouv. Remèdes, Aug. 24, 1887.

Grandiflorine.—An alkaloid from the fruit of *Solanum grandiflorum* which see under "Materia Medica."

Vasicine.—A new alkaloid from the leaves of *Adhatoda vasica*, which see under "Materia Medica."

Naregamine.—A new alkaloid from *Naregamia alata*, which see under "Materia Medica."

Bursenine.—A new alkaloid from *Capsella Bursa pastoris*, which see under "Materia Medica."

Ricinine—Characters, etc.—See *Ricinus communis*, under "Materia Medica."

Anagyrine—A New Base from Anagyris fœtida, which see under "Materia Medica."

Lappine—Non-Existence as an Alkaloid.—See *Burdock Fruit*, under "Materia Medica."

Trigonelline and Choline—Alkaloidal Constituents of Trigonella Foenum-graecum, which see under "Materia Medica."

Two New Alkaloids from the Root of Xanthoxylum senegalensis are described by Messrs. Giacoso and Monari.—See *Artar Root*, under "Materia Medica."

Calycanthine—An Alkaloid from the Seeds of Calycanthus glaucus, Willd., which see under "Materia Medica."

Bromhydrate of Conicine—Value in the Treatment of Tetanus and Trismus.—Bromhydrate of conicine has been used successfully in the Children's Hospital, at Berne, in the case of a child of seven years, suffering from tetanus and trismus. The medicament was used hypodermically—two doses of 2 mgm. each at intervals of two hours, after which the child was able to swallow liquids. The same dose was given by the mouth until three doses had been given, which lessened the spasm. On the second day, four doses were given, and on the third, three, when the trismus disappeared, and the reflex troubles diminished. This is in accord with

Schultz and Binz's experiments with conicine upon animals poisoned with brucine.—Nouv. Remèdes, Jan. 24, 1888; Amer. Jour. Pharm., March 1888, 140.

Urea—Volumetric Estimation.—Dr. G. Campanini communicates the following method for the estimation of urea, which is based upon the decomposing action exercised by nitrous acid upon urea to form carbonic anhydride, nitrogen gas and water. In a glass flask of about 200 c.c. capacity, place 20 c.c. of a 10 per cent. solution of nitrite of potassium, then 2 c.c. of the urine, or of the liquid containing the urea, and then 2 c.c. of a 5 per cent. solution of sulphuric acid (or 1 c.c. of the diluted sulphuric acid of the U. S. P., 1880). After the addition of the acid, through the safety tube, conduct the evolved gases through the other tube alongside, descending into a flask containing 110 c.c. of lime-water. Warm, very slightly, the urea-containing flask, so that the reaction takes at least fifteen minutes time. When the connecting tube becomes warm from hot aqueous vapor, the operation is at an end and the lime solution should be removed at once. Now measure 10 c.c. of this liquid, turbid with its suspended calcium carbonate and color rose-violet, with a drop of an alcoholic solution of phenolphthaleine, and, first, determine the number of c.c. of a solution of oxalic acid, containing 3.15 gm. to the liter, that are needed to neutralize the 10 c.c. of the liquid. Then multiply the volume of the oxalic acid solution used by 0.0165 and subtract the product from the number 0.15; the difference indicates the amount of urea contained in the 2 c.c. of urine or the urea containing liquid examined. The author gives the results of a number of determinations, first, upon a solution of urea, 25 to 1000, and then upon urine, in comparison with the well-known process of Liebig; the latter results are as follows:

Urine used.	Oxalic Acid used, 10 c.c. of Lime Water.	Urea in 1 Liter, (Campari).	Urea in 1 Liter, (Liebig).
2 c.c.	6.6 c.c.	20.55 gm.	20.20 gm.
2 c.c.	6.3 c.c.	23.05 gm.	22.90 gm.
2 c.c.	6.45 cc.	21.80 gm.	21.55 gm.
2 c.c.	6.95 c.c.	17.70 gm.	17.35 gm.

These results, according to the author, demonstrate that this nitrous acid method conduces to the best results obtainable. But in order to secure absolutely accurate results, it is necessary that the heating of the flask be slow, in order to avoid, especially, the raising of the vapor of nitric acid that could be formed, by the decomposition with the sulphuric acid, from the potassium nitrate, always present in the commercial nitrite. The author communicates a table of equivalents.—Amer. Jour. Pharm., Oct. 1887, 494; from Annali di Chim., 1887, 156.

Ptomaines—Recent Researches.—Recent researches of Messrs. Brouardel, Ogier and Minovici, communicated to the Paris Academy of Medicine (June 28, 1887), have developed the following principal facts and conclusions respecting the cadaver alkaloids. The liver and kidneys furnished residua which generally gave the same reactions. The most abundant residua were given by amylic alcohol (alkaline solution); next came benzin and chloroform (acid solution). In a single case (fœtal and free from putrefaction), no alkaloidal reaction was presented. In all others, basic substances were obtained capable of precipitation by the general reagents; the most sensitive of the latter was liq. iodini comp. The residua appeared in notable quantity in viscera newly putrefied (two to four days in summer); they were more abundant in cadavers of eight to twenty days. After two years or over, the amount of ptomaines visibly diminished. An examination of our tables will give an idea of how much confidence should be accorded to the various colored reactions in searching for toxic vegetable bases, and will show the influence of the ptomaines upon these reactions. For example: perchloride of iron gave no coloration; hence it is a good reagent for morphine; alcoholized potassa, after oxidation by nitric acid, gave no violet reaction, comparable with that which atropine would give; nitric acid alone generally produced yellow or orange colorations, much less intense than brucine would have given, but capable, up to a certain point, of being confounded with the tint which a trace of morphine would have given. The use of reagents containing a large excess of sulphuric acid (molybdate, vanadate, selenite, etc.), is made very uncertain by the presence of ptomaïnes. We obtained, in fact, colorations of variable tones, reddish, sometimes violet, and oftener identical with those which sulphuric acid alone would have given. With bichromate and sulphuric acid we saw produced on a single occasion only, a violet tint analogous to that which a trace of strychnine would give. With alcoholized sulphuric acid and ferric perchloride, certain residua gave greenish tints, which could be confounded with the coloration given by digitalin in like conditions. It is important, therefore, to take account of the various causes of error, but we must not exaggerate their importance. The colorations due to the ptomaïnes are never in fact so clear and so evident as colorations of the same kind produced by vegetable bases. If we remember that a single color-reaction would not suffice for the official conclusions of the expert, and that he would also have to depend upon the agreement of a group of chemical or physiological signs, we will see that the chances for error are in reality infinitely small. But if it appears to us altogether improbable that the medico-legal expert would confound a ptomaïne with a vegetable base, it is also very certain that the presence of the ptomaïnes would obscure, in a large measure, the clearness of reaction in the toxic alkaloids which might really exist in the extraction made; and consequently that small quantities of these alkaloids might remain unperceived. The complete purification of the residua, the separation of the ptomaïnes and the vegetable bases is, therefore, for toxicological research, a problem of the highest importance, and one whose solution is yet to be found.—Amer. Jour. Pharm., Oct. 1887, 491–492; from Archives de Pharmacie, August 5, 1887.

Ptomaïnes—Review.—Professor Charles O. Curtman has delivered a lecture before the Society of German Physicians of St. Louis (Oct. 14, 1887), in which he very comprehensively reviews the observations that have hitherto been made respecting the varieties and character of the ptomaïnes and their relations to the bacteria. The address is communicated to, and may be consulted in, Pharm. Rundschau, Dec. 1887, 275-278.

Cadaverine—Identity with Pentamethylendiamine.—Prof. A. Ladenburg has determined incontrovertibly that cadaverine is identical with pentamethylendiamine, and announces his observations in a paper in Ber. d. D. Chem. Ges. (1887, 2216).—Arch. d. Pharm., Sept. 1887, 824.

Pyridine—Method of Use, etc.—Dr. Germain Sée in continuation of his former observations (see Proceedings, 1885, 336), recommends that pyridine be inhaled three times a day for twenty minutes, from a warm saucer into which a teaspoonful of the pyridine has been poured. After each sitting the patient should take a tablespoonful of the following: Syr. tolu and syr. papaveris, of each 250 gm.; pot. iodidi, 25 gm.—Amer. Jour. Pharm., Oct. 1887, 490; from Nouv. Remèdes, Aug. 24, 1887.

Pyridine Bases—Precaution in Applying the Chloride of Cadmium Tests.—To determine the quality of the pyridine at bases to be used with wood spirit for "denaturating" alcohol for manufacturing purposes, the German governmental test requires that a 5 per cent. solution of chloride of cadmium added to an aqueous solution of the pyridine, 1:250, should occasion distinct turbidity after standing a short time. Messrs. Weppen and Lüders now draw attention to the observation that the test may fail, owing to too great acidity of the chloride of cadmium. Two samples of this salt examined by them contained, respectively, 37.58 and 36.63 per cent. of Cl, both varying from the quantity required in the official salt.—Chem. Ztg., Feb. 1, 1888, 151.

Pyridine Bases—Titration.—Mr. K. E. Schulze has found ferric chloride (or ferric oxidhydrate) an excellent indicator for the titration of the pyridine bases. The method is as follows: 5 c.c. of pyridine are dissolved in 100 c.c. of water, and to 25 c.c. of the solution 1 c.c. of a 5 per cent. solution of ferric chloride is added, ferric oxidhydrate being separated. 10 c.c. of normal sulphuric acid are added, and then in quantities of 3 to 4 drops until the ferric oxide is re-dissolved, stirring well and waiting ½–1 minute after each addition. The end of the reaction is sharply defined.—Chem. Repert. (Chem. Ztg.), Jan. 29, 1888, 30; from Ber. d. D. Chem. Ges., 1887, 20, 3391.

Antipyrine—Characters, etc.—Messrs. F. Gay and H. Fortuné have determined the melting-point of antipyrine (for which they give the synonym "analgesin") to be 110° C., when the substance is completely dried at 100° C. for six hours, and over sulphuric acid for twelve, 0.6 per cent. being lost during this treatment. They find the solubility of antipyrine to be for 1 part: 1 part of water at 12° C.; ½ part of hot water; 2 parts absolute alcohol; 1 part 80 per cent. alcohol; 1 part of amylic alcohol: 50 parts of ether; 1½ parts of chloroform; nearly insoluble in petroleum ether, very soluble in mineral acids, with which it forms salts. The authors describe numerous reactions with oxidizing, reducing, dehydrating, and alkaloid reagents, which are characteristic and serve for its identification.—Pharm. Jour. and Trans., June 23, 1888, 1066–1067; from Jour. de Pharm., June 15, 1888, 594.

Antipyrine—Tests for Adulterants.—It having been stated that antipyrine is frequently adulterated with benzene and phenylhydrazin, the "British Medical Journal" mentions the following tests: Antipyrine does not change litmus paper; it is easily soluble in water, alcohol, and benzol; it is also soluble in chloroform and glycerin, but not so quickly. Treated with picric acid, chloride of gold, or platinum, antipyrine gives a yellow precipitate; with perchloride of iron a blood-red precipitate is obtained; nitrous acid produces a green precipitate, and permanganate a blood red precipitate. The presence of phenylhydrazine in antipyrine is shown by the reduction of Fehling's solution. The presence of benzene is detected by Berthelot's process. Antipyrine is mixed with nitric acid; ether is added; the liquid is then filtered and distilled; chloride of lime is then added; and if the antipyrin contains benzene the mixture assumes a violet hue.—Drugg. Circ., March 1888, 57.

Antipyrine—Comparison with Antifebrin.—Dr. G. W. Barr finds that while antipyrine is followed by a feeling of great *malaise*, with antifebrin there are no after-effects. Antipyrin caused diaphoresis and slightly slowed the pulse; antifebrin caused diuresis and strengthened the pulse. Dr. Barr prefers antifebrin because the dose is smaller, the effect on the temperature more powerful and more permanent, and the influence on the heart tonic. The comparatively slow action is the only objection to its use.—Phar. Jour. and Trans., Aug. 27, 1887, 170.

Antipyrine—Value as a Remedy for Headache.—Dr. J. Ogilvy is credited with having made the interesting discovery that antipyrine is of great value in the treatment of bilious headache. He found that given in 8 grain doses it is wonderfully potent, not only cutting short the attack, but sensibly diminishing the frequency of its occurrence. A second dose is given in an hour, and a third dose is rarely necessary, sleep or pleasant languor following its administration. No unpleasant after-effects are felt, but the appetite at once returns and the patient feels well.—Pharm. Jour. and Trans., Aug. 27, 1887, 170; from Brit. Med. Jour., 1887, 123.

Antipyrine—Use as a Substitute for Morphine to Relieve Pain.—Dr. Sée, in a recent communication, affirms that antipyrine may with advantage replace morphine in nearly, if not all, cases where that alkaloid is injected subcutaneously for the relief of pain, antipyrine being free from many of the objectionable consequences attending the use of the opium alkaloid, especially that known as morphism. The subcutaneous injection of antipyrine is said not to be followed by sleepiness, nor vomiting or excitement, but after a short sensation of tension there is a considerable remission of pain from whatever cause.—Pharm. Jour. and Trans., Aug. 27, 1887, 170; from Compt. Rend., cv., 103.

Antipyrine—Addition of Cocaine to Subcutaneous Injections.—Professor Sée observes that sometimes it is desirable to use large quantities of antipyrine subcutaneously to give immediate relief, such as a gram dissolved in an equal weight of water. To avoid the pain consequent upon the injection, he recommends the addition of 15 to 20 mgms. of hydrochlorate of cocaine to this quantity (1 gram).—Pharm. Jour. and Trans., Oct. 29, 1887, 357; from Archives, Oct. 5, 1887, 450.

Antipyrine—Danger Attending its Use.—Prof. Ball reports a case of intoxication, observed by Dr. Jennings in a woman, aged 67, and suffering from rheumatism, who had been taking antipyrine for eight days in the quantity of 2.50 gm. per diem. Vaso-motor troubles appeared, first characterized by erythematous spots on the face, and swelling of the eyelids. Conjunctivitis and a general rash followed, and these symptoms were supplemented by anorexia, vomiting, tinnitus, torpor and refrigeration. The symptoms disappeared readily after the administration of a few drops of tincture of belladonna. Drs. Sée and Dujardin-Beaumetz, referring to this observation of Dr. Jennings, remark that this statement should warn the public of the untoward symptoms to which antipyrine—the use of which was abused at present—might give rise. They do not, however, agree with Dr. Jennings that the symptoms were those of intoxication, properly so-called, and do not justify the use of belladonna. They have sometimes observed gastric troubles following the administration of antipyrine, but thought these were due to impurities, as the medicament often contains benzene. They recommend re-crystallized antipyrine, and if gastric symptoms persist, they should be combated with bicarbonate of sodium and Seltzer water.—Arch. de Pharm., March 5, 1888. Amer. Jour. Pharm., April, 1888, 180.

Antipyrine—Indications and Dangers.—Dr. Huchard says that in certain affections, such as typhoid fever where the kidneys serve as emunctories, care must be used in giving antipyrine. On the other hand, he has given 8 gms. daily to a woman with meningo-myelitis, thus reducing the amount of urine from 24 and 28 litres in 24 hours, to 5 litres. Dr. Huchard also observes that the drug should not be given in arterio-sclerosis even when the kidneys are not involved.

Antipyrine—Dangerous Incompatibility with Spirits of Nitre.—In a former paper (see Proceedings 1886, 637) Dr. Eccles had recorded the fact that antipyrine and sweet spirit of nitre are incompatible. Experience since has proved, as was then predicted, that the combination is dangerous, one child having lost its life by the administration of such a mixture, while numerous complaints have been made respecting the color of the mixture, which, presumed to be colorless and clear, is in point of fact liable to be green, dark green or black, and contain precipitates. The change is due to the fact that antipyrine—which, chemically considered, is dimethyl-oxyquinizine—forms, with the nitrous acid of the spirit of nitrous ether, "iso-nitroso-antipyrine," a crystalline substance having a green color, and a far more dangerous compound than antipyrine itself. In perfectly neutral spirit of nitrous ether this change does not take place, but it is almost impossible to procure such an article or to keep it so when found. Besides nitrous ether, tannic acid and chloride of iron are also incompatible, as are the chlorides of gold and of platinum.—Pharm. Rec., June 1, 1888, 162.

Acetanilid—Reactions, etc.—The following reactions of acetanilid (antifebrin) are given in "Arch. de Pharm." (Sept. 5, 1887): Warm solutions redden with perchloride of iron, and dilute chromic acid gives a darker shade of the same color. When acetanilid is heated with nitrate of mercury it dissolves; the addition of sulphuric acid gives a bright red. This reaction is common to resorcin, phenol, thymol and salicylic, tannic and gallic acids; benzoic acid is an exception. It may be isolated with ether or chloroform from urine to which it has been previously added. But this reaction does not take place in the urine of patients who are taking the medicament, showing that it had undergone a change before reaching the urinary organs. Such urine should be treated by ether, then by caustic soda; this should be neutralized with sulphuric acid and the ether evaporated. By this means Cahn and Hepp claim to have obtained crystals presenting the characteristics of acetanilid. Della Cella also obtained these crystals, but states that they did not give the reactions indicated above.—Amer. Jour. Pharm., Oct. 1887, 491.

Acetanilid (Antifebrin)—Reactions.—Dr. Vulpius communicates the following tests for antifebrin: (1) Boil a little of the substance in a short, wide test-tube a few minutes with about 20 minims of liquor potassa. Then bring a drop of a one per cent. solution of chlorinated lime, on a glass rod, into the vapor rising from the mixture, when the drop will assume a deep amber-yellow color, showing after a time a violet hue in reflected light. (2) Add to the solution suspected to contain antifebrin

(e. g. a specimen of urine concentrated by evaporation), some hydrochloric acid, and boil a few minutes. When cold shake with ether, which will take up any aniline formed. Separate the ether, evaporate, add to the residue 40 minims of saturated aqueous solution of phenol and 20 minims of a one per cent. solution of chlorinated lime. In the presence of aniline (produced by the decomposition of the antifebrin), a reddish color is produced, which is changed by the addition of ammonia to a beautiful blue.—Pharm. Era, Dec. 1887, 446; from Apoth. Ztg., no. 29, 1887.

Acetanilid (Antifebrin)—Test of Purity.—Dr. Flückiger recommends the following method for determining the purity of acetanilid: Two centigrams acetanilid with one centigram caustic potash are triturated together, first wetting with a little chloroform; the mixture is at once placed in a test tube and very gently heated. The mixture becomes brown and emits the very peculiar smell and unmistakable vapor of isocyanphenyl.—Rundschau, Prag, 1887, 897; from Apoth. Ztg.

Antifebrin—Test of Distinction from Antipyrin.—Mr. F. Schlosser heats 20 centigrams of antifebrin (acetanilid) with 4 c.c. of concentrated sulphuric acid till it is colored yellow. A few drops of the cooled solution are run down the side of a test tube half filled with chlorine water, when a layer of a beautiful dark violet color is formed at the bottom, while the upper layer appears light green. Antipyrin does not show this reaction.—Drugg. Circ., Feb. 1888, 34; from Zeitschr. Oest. Apoth. Ver.

Antifebrin—Presence of Unaltered Aniline.—Mr. Salzer draws attention to the occurrence of unaltered aniline in antifebrin and recommends the following tests for its detection or absence: If pure acetanilid is dissolved in cold hydrochloric acid and covered with solution of chloride of lime a white precipitate is formed, which is redissolved on shaking the mixture, but again separates after a time, forming beautiful silky colorless needles. In the presence of aniline the known color reaction takes place, indicating the formation of magenta.—Pharm. Jour. and Trans., June 30, 1888, 1085; from Pharm. Ztg., June 20, 1888, 364.

Kairine, Antipyrine, and Antifebrin—Reactions.—Mr. Kohn gives the following reactions for the above-named antipyretics:

Kairine, with a drop of ferric chloride in a weak aqueous solution, instantly assumes a violet color that rapidly passes to brown. An excess of ferric chloride to a strong solution of kairine produces an almost black precipitate. Bichromate of potassium, in neutral solution, gives an intense coloration and separates a violet pigment, on standing, which, dissolved in alcohol, forms a black solution.

Antipyrine in weak solution forms a rose color with ferric chloride that is visible in a 1 to 100,000 solution. With nitrous acid added to a dilute solution, a blue-green color is produced, while in the concentrated solution green crystals are deposited.

Antifebrin with the reagents previously mentioned undergoes no change, but boiled with potassium hydrate, evidence of the existence of aniline is obtained, and, after distillation, potassium acetate may be found in the retort.

In the Apoth. Zeitung the following test is given for antifebrin: Boil a few centigrams of antifebrin, with one c.c. of officinal solution of potassium hydrate, and hold suspended in the tube a glass rod which has been dipped in a solution of chlorinated lime; the drop of solution suspended on the end of the rod will acquire an amber color, which, on continuing the ebullition, passes little by little to violet. The violet coloration results from aniline, which is produced from the antifebrin by the boiling caustic potassa. It may be well to further note that if the test is made directly with aniline, the violet coloration of the drop appears at once, without the primary change to amber color, as in the case of antifebrin.—Amer. Jour. Pharm., Oct. 1887, 493; from L'Orosi, 1887, 114 and 274.

Antipyretics—Review.—Dr. E. R. Squibb in "Ephemeris" (June 1888, 1063–1068) reviews the different antipyretics that have been introduced into medicine during the past few years. The review embraces the following: Chinoline, salicylic acid, kairine (kairin), kairoline, antipyrine, thallin, antifebrin, salol, antithermin. While the review brings nothing that is new or original by the author, it will be consulted with interest as a compilation by a close observer of the statements that have been made by others respecting them.

Phenacetin—Antipyretic Value and Doses.—Dr. Grenfell has experimented with phenacetin upon several cases of pyrexia in the Wandsworth and Clapham Infirmary, his results showing that it is an undoubted antipyretic. The effect is perceptible half an hour after its administration; the patient generally perspires freely and feels drowsy, and after sleep is freer from pain and more comfortable. The most satisfactory dose for an adult was found to be about 8 grains.

Dr. Roe, speaking of its antipyretic properties, states that he has found phenacetin to act admirably in from four to twelve grain doses, and that it has a greater and more prolonged effect upon the temperature than antipyrin, whilst it produced no rigors, vomiting or nausea.

Dr. Koller, of Vienna, also has published his experience with phenacetin, which fairly agrees with the foregoing. But he states that when the fall in temperature is accompanied by perspiration, which is not usual, great care is required in exhibiting the drug.—Phar. Jour. and Trans., June 2, 1888, 1005; from Practitioner, May 1888, 344, and Brit. Med. Jour., May 26, 1881, 1113.

Phenacetin—Tests for the Presence of Acetanilid (Antifebrin).—In view of the close resemblance of antifebrin and phenacetin, and the possible adulteration of phenacetin with antifebrin, on account of the wide difference in the cost of the two substances, Mr. Schwarz suggests the following method of detection: 1. If 1 gram of phenacetin be heated with 2 c.c. of soda solution, upon the addition of a few drops of chloroform and again heating the odor given off is aromatic and not disagreeable; but in the presence of acetanilid the isonitril reaction occurs, and the extremely repulsive but characteristic smell of phenyl carbamine becomes perceptible. 2. When acetanilid is boiled with caustic soda solution, a separation of oily drops of aniline, floating on the surface of the liquid, occurs, while no such separation takes place when phenacetin is similarly treated. 3. If the liquid resulting from the treatment of acetanilid with caustic soda solution is shaken with ether, the ether-solution evaporated, a little water added to the residue, and then a drop of liquefied carbolic acid followed by some filtered 10 per cent. solution of chloride of lime, a blue-green color is developed, which is changed to onion-red by a drop of hydrochloric acid and restored by saturation with ammonia. Phenacetin similarly treated, gives with chloride of lime a cherry red, which is not affected by hydrochloric acid or by ammonia.—Pharm. Jour. and Trans., June 30, 1888, 1085; from Phar. Ztg., June 29, 1888, 364.

Mr. Ritsert, commenting on the above, recommends the substitution of a fragment or two of chloral hydrate for the chloroform, as the reaction is more delicate in the presence of nascent chloroform.—Ibid, from Ibid, June 27, 1888, 383.

Hydroxylamine Hydrochlorate—Use as a Substitute for Pyrogallic Acid and Chrysarobin in Skin Diseases.—Messrs. Gehe & Co. draw attention to hydroxylamine hydrochlorate, which, on account of its strong reducing action, might be suitable to replace pyrogallic acid and chrysarobin in the treatment of skin diseases, whilst it would offer the advantage of being colorless.—Pharm. Jour. and Trans., May 5, 1888, 922; from Gehe & Co.'s Handelsbericht, April 1888.

Metaphenylendiamine Hydrochlorate.—Use as a delicate test for the presence in alcohol of *Aldehyde*, which see under "Alcohols."

Chinotoxine—A New Synthetic Compound.—Chinotoxine is the convenient name applied to a new synthetic compound which is also called

Dichinolindimethylsulphate.—The new compound has been found to possess properties similar to curare and "curarine," but Messrs. Gehe & Co. do not seem to have much faith in its vitality.—Amer. Drugg., June 1888, 106; from Gehe & Co.'s Handelsbericht, April 1888.

Aniline Colors—Solubility in Water and in Alcohol.—The following table of the solubilities of the principal aniline colors will be found convenient for reference. The solubilities were determined by Mr. A. Brunner:

Aniline color.	Per cent. soluble in water.	Per cent. soluble in alcohol.
Aethyl orange	0.02	nearly insoluble.
Aurin	nearly insoluble.	40.00
Bismarck brown	3.00	0.35
Corallin	2.00	0.50
Dahlia blue	4.00	1.00
Eosin	2.00	1.00
Fuchsin	0.30	10.00
Gentian violet	1.50	3.00
Luteolin	0.25	0.60
Magenta red	0.20	2.50
Malachit green	4.00	5.00
Manchester yellow	2.00	0.15
Methyene blue	3.00	1.50
Methyl green	7.00	0.25
Methyl violet	2.00	1.50
Safranin	0.60	0.40
Tropæolin OO	0.05	0.10
Vesuvin	2.00	0.20

—Arch. d. Pharm., Sept. 1, 1887, 782; from Pharm. Centralh., 1887, 385.

Bichromate of Aniline—Preparation and Characters.—According to Messrs. Girard and L'Hote, bichromate of aniline may be produced in well defined crystals, as follows: Two saturated solutions are prepared, one of hydrochlorate of aniline, and one of bichromate of potassium, sodium, ammonium or calcium. The solutions, in equal volumes, should be mixed while very cold. Very numerous yellow crystals are thus formed, which are then freed with water from all traces of alkaline chloride and dried *in vacuo.* The substance thus obtained is found by Girard and L'Hote to have the formula $C_{12}H_4(NH_3)2CrO_3$. This bichromate of aniline is sparingly soluble in cold water (about 4 to 1000) and is decomposed by boiling water. It is slightly soluble in alcohol, which it slowly transforms into aldehyde. When dry it undergoes no change; when moist it changes greatly under the influences of light and air. It decomposes under slight elevations of temperature, and burns in contact with flame or under the stroke of a hammer. It inflames also in contact with fuming nitric acid; with sulphuric acid it burns like pyrophoric copper. Treated with cold water it gives rise to violet tints; treated with hydrochlorate of aniline and aniline in excess similar colorations are obtained.—Arch. d. Pharm., Oct. 1887; Amer. Jour. Pharm., Nov. 1887, 560.

Congo Red—Use as Indicator in Volumetry.—Prof. v. Brücke, referring to the recommendation by Mr. L. Storch, of congo red as an indicator in volumetric analysis, observes that in his own experience he has found it unsuitable for this purpose, but that it may now and then prove useful in gravimetric analyses. In his paper, communicated to the Vienna Academy of Sciences (Jan. 1888), he discusses the causes of the influences exerted by neutral salts and other neutral compounds upon the congo-red reaction, which is likewise acted upon unfavorably by elevation of temperature.—Pharm. Post, March 11, 1888, 167.

Camphorate of Aniline—Preparation and Characters.—This preparation, which many years ago was recommended by Tomaselli as an antispasmodic remedy, has recently again been brought to notice. Dr. Vulpius recommends its preparation by placing 100 parts of finely powdered camphoric acid and 93 parts of pure aniline into a close vessel, and heating it in boiling water until solution is effected; then immediately transferring the liquid into the bottle in which it is to be kept, when it will congeal to form a firm crystalline mass. While the solution of the camphoric acid is very rapid, when in the proper proportion, it is impossible to dissolve an excess, proving that camphorate of aniline is a definite compound, for which the author gives the formula $(C_6H_7N)_2C_{10}H_{16}O_4$. It is readily soluble in alcohol and in ether, and in 30 parts of water. Glycerin dissolves one-tenth of its weight of the compound, and the solution may be diluted with an equal volume of water without becoming turbid thereby. The glycerin solution, therefore, appears to be the one suited for the medicinal exhibition of the camphorate.—Archiv d. Pharm., July, 1887, 583; from Pharm. Centralh., 28, 283.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Amygdalin.—Localization in the *Almona*, which see under "Materia Medica."

Saponin.—Occurrence in *Acacia delibrata*, which see under "Materia Medica."

Saponin.—Occurrence in *Enterolobium Timbouva*, which see under "Materia Medica."

Saponin.—Probable occurrence in the seeds of *Entada scandens*, which see under "Materia Medica."

Sapotoxin.—Physiological activity. See *Quillaja Bark*, under "Materia Medica."

Santonin—Improved Test.—Mr. J. Kossakowsky, chemist of the santonin works at Tschimkent, Turkestan, improves Lindo's test for santonin, which test consists in dissolving in cold sulphuric acid and adding a very dilute solution of ferric chloride, which causes a red to a purple color. This procedure can only be used when the substance is colorless. The author clears the liquid to be examined with a solution of basic acetate of lead, heats a few drops on a porcelain tile, adds a few drops of concentrated sulphuric acid, and heats again. A purple coloration indicates the presence of santonin.—Drugg. Circ., June 1888, 128; from Pharm. Zeitschr. f. Russl.

Santonin—Determination in Lozenges, which see under "Pharmacy."

Cubebin—Chemical Constitution.—The investigations of Mr. Pomeranz confirm the composition attributed to cubebin by Soubeiran and Weidel, viz., $C_{10}H_{10}O_3$. Experiments to detect easily separable alkyl groups by heating cubebin with hydriodic and hydrochloric acids gave negative results. Piperonylic acid was obtained by the oxidation of cubebin with permanganate of potassium. The results of further experiments appear to show that cubebin is a derivative of pyrocatechin, containing a side chain C_3H_5O, which upon oxidation yields carbonyl, and that this side chain stands in the same relation to the two oxygen atoms of the methylenpyrocatechin residue as the carbonyl group of pyrocatechuic acid to the two hydroxyl groups of that compound.—Pharm. Jour. and Trans., Oct. 29, 1887, 358; from Monatshefte, viii., 466.

Vanillin—Occurrence in Alcohol.—Salzer has determined the presence of vanillin in alcohol, and believes it to have been added for the purpose of covering the odor of fusel oil. Reinke, who has also observed a vanilla like odor in refined spirits, on the other hand believes this to be due to the action of the spirit and air on certain kinds of wood of which the barrels, in which the spirit is stored, have been constructed.—Chem. Repert., Dec. 11, 1887, 304; from Ztschr. f. Spiritus Industrie, 1887, 10, 331.

Vanillic Phloroglucin—A New Reagent for Hydrochloric Acid in the Gastric Juice.—Prof. Germain Sée has adopted a mixture of vanillin and phloroglucin, known as Gunzburg's Reagent, in his researches upon the chemistry of the gastric juice, and especially upon the amount of hydrochloric acid contained in the stomach in its pathological as compared with its normal condition. Mr. E. Bourquelot describes the reagent as follows: To prepare it, dissolve 2 gms. of phloroglucin (isomeric with pyrogallic acid), and 1 gm. of vanillin (aldehyd of methyl protocatechuic acid) in 30 gms. of absolute alcohol, thus obtaining a yellowish-red solution. This, added to hydrochloric or other mineral acid gives a bright red reaction. When these acids are greatly diluted, as in the liquid from an impoverished stomach, the action does not take place, and then a few drops of the stomachal liquid and an equal quantity of the reagent are heated in a small porcelain dish in the water bath. If HCl be present a red color shows at the sides of the capsule and increases in extent as the liquid evaporates. The action is clear with liquids containing one per cent. of the acid, and becomes brighter in proportion to the amount present.—Amer. Jour. Pharm., May 1888, 240; from Jour. de Pharm. et de Chim., April 1, 1888.

Coumarin—Distribution in Plants.—Dr. Lojander gives a table of plants in which coumarin has been found. It comprises not less than 31 species in 2 families. The curious thing about it is that coumarin is found in only a few species of a tribe, and is not in all the remaining species: Filices, Polypodiaceæ; Adiantum pedatum, L.; A. peruvianum, L.; A. trapeziforme, L. Palmæ: Phœnix dactylifera, L. Gramineæ: Anthoxanthum odoratum, L.; Cinna arundinacea, L.; Hierochloa alpina, R. et. S.; H. australis, R. et. S.; H. borealis, R. et. S.; Milium effusum, L. Orchidaceæ: Aceras anthropophora, R. Br.; Angræcum fragrans, Thouars; Nigritella angustifolia, Rich.; Orchis fusca, Jacq. Caryophyllaceæ: Herniaria glabra, L. Rutaceæ: Ruta graveolens, L. Rosaceæ: Prunus Mahaleb, L. Papilionaceæ: Dipterix odorata, Willd. D. oppositifolia, Willd.; D. Pteropus Mart. (?); Melilotus albus Desr.; M. altissimus, Thuillier; M. hamatus, Stocks; M. leucantha, W. et A., M. officinalis, Desr; Toluifera Balsamum. Apocynaceæ: Alyxia stellata, R. et Sch. Rubiaceæ: Asperula odorata, L.; Galium triflorum, Michx. Compositæ; Liatris odoratissima, Willd.; L. spicata, Willd.—Drugg. Circ., Nov. 1887, 249; from Jour. de Pharm. d'Als.-Lorr.

Strophanthin—Improved Process of Preparation.—Mr. W. Elborne, in his paper on *Strophanthus*, which see under "Materia Medica," gives his reasons for preferring one of the two following processes for preparing strophanthin:

1. The finely powdered seed is mixed to a very thin paste with distilled water containing 10 per cent. of added alcohol, set aside for 12 hours, six times the volume of absolute alcohol added, the mixture well agitated, set aside for 6 hours, filtered, residue washed with rectified spirit, and four-fifths the volume of the mixture distilled off. Solution of subacetate of lead in excess is added to the residue, the mixture heated to the boiling-point, filtered, the precipitate washed with a little distilled water, and the filtrate allowed to cool; sulphuretted hydrogen is passed through the cold filtrate to precipitate the lead, which is filtered off, and the filtrate agitated with three volumes of amylic alcohol, and set aside. The alcoholic layer being removed, it is distilled to a small volume on the water bath, the final portion being evaporated in an open dish at the temperature of the water bath. The strophanthin is then left in a colorless condition, constituting when removed a non-deliquescent white powder.

2. The finely powdered seed is macerated for 12 hours with 4 times its weight of distilled water to which 10 per cent. of alcohol has been added; the mixture is strained, agitated with a fresh portion of the same menstruum, and again strained. The mixed liquids are then agitated with one-sixth the volume of petroleum ether, which being removed and rejected, the aqueous portion is treated precisely as in the above process, subacetate of lead, etc.—Yearbook of Pharm., 1887, 423–424.

Strophanthin—Preparation and Characters.—Dr. T. R. Frazer, in continuation of his former observations and investigations of *Strophanthus* *hispidus*, contributes some further information respecting the preparation and characters of strophanthin. This principle occurs most abundantly in the seeds. Starting with crude strophanthin, as obtained by his earlier process, it is dissolved in water, tannic acid is added, and the tannate digested with recently precipitated oxide of lead. Rectified and proof spirit are now used to extract, and the extract obtained is dissolved in a small quantity of rectified spirit, and the solution precipitated by ether. The precipitate is finally dissolved in weak alcohol, and through this solution carbonic anhydride is passed for several hours, by which means lead is completely got rid of. After filtration the solution is evaporated at a low temperature and dried *in vacuo* over sulphuric acid.

Strophanthin thus obtained is imperfectly crystallized, neutral in reaction, intensely bitter, freely soluble in water, less so in rectified spirit, and nearly insoluble in ether and chloroform. It burns without residue, and contains no nitrogen. The percentage composition from the average of several closely agreeing results was found to be—

$$C = 55.97,\ H = 7.75,\ O = 36.28,$$

which agrees fairly with the formula $C_{20}H_{34}O_{10}$.

Strong sulphuric acid produces with strophanthin a bright green color, which soon becomes greenish-yellow and brown. Sulphuric acid and potassic bichromate give a blue color in addition to the coloration caused by the acid alone. Phosphomolybdic acid produces a bluish-green color, which on addition of water becomes pure blue. With a 1 per cent. solution in water, phosphomolybdic acid causes slowly a bright bluish-green color. Tannic acid produces an abundant white precipitate, soluble both in excess of the acid and of strophanthin. The solution is not changed in appearance by acetate or subacetate of lead, platinic chloride, ferric chloride, or mercuric chloride. Nearly all acid reagents cause the solution to become hazy, and it is then found that the solution contains glucose. This decomposition is also produced by sulphuretted hydrogen, especially in the heat, and for this reason it is not advisable to use sulphuretted hydrogen in any process for preparing strophanthin. Indeed, all mineral acids (except carbonic acid) and many of the organic acids, resolve strophanthin, even in the cold, into glucose and a substance which the author has named "strophanthinidin." The glucosidal characters of strophanthin, the author considers, are thus amply demonstrated.—Pharm. Jour. and Trans., July 23, 1887.

Strophanthin—Characters.—Mr. Catillon has extracted strophanthin from the seeds of *Strophanthus Kombé*, obtaining 9.5 gm. from 1 kilogm. It crystallizes in microscopic needles, which are transparent when damp, but become opaque on drying. They have a neutral reaction, and their solution is not affected by the usual characteristic alkaloidal precipitants. Strophanthin is soluble in 13 parts of cold absolute alcohol, and in 3 or

4 parts at a boiling temperature. On pouring a hot alcoholic solution into cold water, the substance at once separates in form of crystals. The hydrated crystals dissolve easily in water; but after they are dried, it requires about 30 parts of water to dissolve them. It is insoluble in ether and in chloroform free from alcohol. The dose of strophanthin is one or two granules containing $\frac{1}{10}$th of a milligram (about $\frac{1}{640}$th grain) each. —Amer. Drug., May 1888, 83; from Arch. de Pharm.

Strophanthin—Chemical Characters, etc.—See *Strophanthus hispidus*, under "Materia Medica."

Chrysophanic Acid.—Probable presence in the leaves of *Cassia marilandica*, L., which see under "Materia Medica."

Chrysarobin—Yield from Araroba.—Messrs. Gehe & Co. state that araroba, as now imported, is said to give a smaller yield of chrysarobin than that mentioned by Professor Liebermann in his paper on this substance. The raw material contains 30 per cent. and upwards of moisture, whilst the dried substance seldom yields more than 60 to 70 per cent. of chrysarobin, and frequently less than 50 per cent.—Pharm. Jour. and Trans., May 5, 1888, 922; from Gehe & Co.'s Handelsbericht, April 1888.

Chrysarobin—Artificial Substitutes.—In a former investigation (see Proceedings 1879, 474), Messrs. C. Liebermann and P. Seidler had shown that the active principle of Goa powder is not chrysophanic acid, but *chrysarobin*, in which the quinone-group of chrysophanic acid is partly reduced, in consequence of which chrysarobin combines readily with oxygen, particularly when in alkaline solution, a behavior which is also observed with an alkaline solution of pyrogallic acid. Mr. C. Liebermann now observes that at that time it was already pointed out that the remedial effects of Goa powder were probably not due to the chrysophanic acid produced from chrysarobin by oxidation; but most likely to the reducing action of the latter, to its strong affinity for oxygen. The leuco-substances of many coloring matters closely resemble chrysarobin in the property of absorbing oxygen; but nearest to it in their constitution are the leuco-bodies of the anthraquinone coloring matters alizarin, flavopurpurin, anthrapurpurin, anthragallol, and others. Granting the correctness of my view, it was to be expected that these leuco-bodies should possess remedial properties similar to those of chrysarobin. For therapeutic purposes only such deserve to be considered which may be readily prepared on a large scale, and among these alizarin and the two purpurins are obtainable at a relatively low price. The first experiments were made with the reduction product of pure flavopurpurin, and after its efficacy was ascertained, the corresponding product of pure alizarin was prepared and found to be equally efficient; it does not, therefore, appear to be necessary for the purpose in view to keep these two coloring matters absolutely separate, and the subsequent experiments were made with commercial alizarin and purpurin. The author proposes for this group of substances so produced the name "anthrarobins," and for the particular product obtained from commercial alizarin the name of

Anthrarobin.—Those prepared from the commercial purpurins will be distinguished by prefixing the letter *p* or *f*.

Commercial anthrarobin is a yellowish white powder, permanent in the air, insoluble in water and dilute acids, but readily soluble with a brown yellow color in dilute solutions of alkalies and alkaline earths, the solutions in contact with oxygen passing through green and blue finally into alizarin violet. This change of color is best observed by agitation of the dilute solution in a test-tube held over white paper; if from 0.25 to 0.5 gm. of the substance, together with some alkali solution, be thus agitated in a test-tube closed by the thumb, a diminution of pressure in the tube will be observed.

Anthrarobin dissolves with difficulty in benzol and chloroform; but in glacial acetic acid and in alcohol it is much more soluble than chrysarobin. It required 5 parts of 90 per cent. alcohol for solution in the cold, the liquid being of a brown yellow color; hot alcohol dissolves it instantly. Long continued boiling causes decomposition: but the cold alcoholic solution may, in a well-corked vial, be kept for weeks with but slight alteration. The compound is also soluble in glycerin, and the alcoholic solution may be diluted with glycerin without precipitation taking place. Commercial anthrarobin contains a trace of zinc, but the ash amounts only to one-third per cent.

Dr. G. Behrend has used anthrarobin for herpes tonsurans, pityriasis versicolor, eczema marginatum and psoriasis, effecting cures in 14 cases. He regards it as somewhat less efficacious than chrysarobin, but more so than pyrogallol; it colors the skin slightly brown, but does not produce inflammation, and may be employed on the face; the stains on clothes are removed with the aid of soap and soda.

The new remedy has also been used by Professor Dr. Köbner with favorable results in psoriasis, pityriasis and papulous syphilis.—Ber. d. D. Chem. Ges., 1888, 447–452; Amer. Jour. Phar., 1888, p. 257.

Anthrarobin—Value as a Substitute for Chrysarobin.—It is stated that anthrarobin is less toxic than chrysarobin, for which several German physicians wish to substitute it. Rabbits absorb 1 gm. without inconvenience. It is eliminated by the kidneys, after changes not yet studied. Doctors who use it make topical applications (in the form of unguents) against psoriasis, herpes, etc., or employ it in 10 to 100 alcoholic solutions, which are preferable. The ointments consist of 10 or 20 to 100. Its efficaciousness is heightened with soap and water after the inunction. Applied to the scalp it turns the hair red.—Amer. Jour. Pharm., May 1888, 239; from Arch. de Pharm., April 5, 1888.

Boldoin—Hypnotic Action.—According to the observation of Mr. Juranville, boldoin, the glucoside of boldo leaves (see Proceedings 1885, 194), far exceeds in its hypnotic and narcotic action opium, chloral, or any other similar agent. The quantity that can be given daily without ill effects is stated to be as much as 5 to 10 grams. The yield of boldoin from the leaves is given as 3 per cent.—Pharm. Jour. and Trans., June 30, 1888, 1086; from Chem. Ztg., June 17, 1888, 166.

Condurangin—Remedial Uses.—Condurangin, the glucoside from condurango bark (*Gonolobus Condurango*—the Mattaperro Condurango bark) is now an article of commerce. It is an amorphous powder, soluble in water, in alcohol, and in chloroform. It has been used in gastric diseases with alleged success.—Amer. Drugg., May 1888, 83.

Cathartic Acid. — Probable presence in the leaves of *Cassia marilandica*, L., which see under "Materia Medica."

Leontin—A New Glucoside from Blue Cohosh.—Prof. J. U. Lloyd describes the method of preparation and characters of a new glucoside, which he has determined in blue cohosh, and which he has named "leontin." It constitutes pure white, feathery crystals, resembling quinine, is slightly soluble in cold alcohol, s. g. 0.820, very soluble in boiling alcohol, and has similar solubilities in ether, and in absolute alcohol. It is insoluble in water, but freely soluble in alkaline water. Leontin is at first tasteless, but owing to the alkalinity of the saliva an acrid taste is soon developed. It is also odorless, but sternutatory like saponin. When boiled with dilute acids it is split into glucose, and a colorless gelatinous body, which is insoluble in water, but soluble in alkaline solutions and in alcohol. The author describes some color reactions with nitric, with sulphuric, and with hydrochloric acid, which are quite sensitive, and are regarded by him to be characteristic.—West. Drug., August 1887, 257–258.

Hesperidin and Naringin—Identity of their Products of Glucosidal Reaction.—Mr. Will states that in heating hesperidin or naringin with dilute sulphuric acid, identical insoluble products are obtained: the hesperidin giving the phloroglucinic ether of paraoxycinnamic acid, while naringin gives that of oxypara-methoxy-cinnamic. As to the soluble products remaining in the water, they were supposed to be different, the sugar of hesperidin being considered as glucose, and that of naringin being regarded as isodulcit. The syrup obtained from hesperidin is not pure; we only verify the existence of the glucose by reduction and fermentation. But the syrup of naringin gives the same reactions, and the extraction of isodulcit from this product is difficult to effect. The author has succeeded in isolating isodulcit from the syrup of hesperidin. He used Fischer's process, treating the syrup with phenylhydrazine. A composite mixture of isodulcitic acid and phenylglucosazone was produced, which was separated by hot acetone, in which the latter is insoluble. Thus, the author concludes that the saccharine matters of hesperidin and naringin are identical.—J. de Ph. et de Chimie, March 15, 1888.

Glucoside of Burdock Fruit.—Prof. Henry Trimble describes a glucoside obtained from *Burdock Fruit* (which see under "Materia Medica") to which, in a previous paper (see Proceedings 1885, 137), he had ascribed alkaloidal characters.

Eupatorin—The Bitter Principle of Eupatorium Perfoliatum.—Mr. F. W. Franz describes the bitter principle, eupatorin, obtained by him from the leaves of *Eupatorium perfoliatum* (which see). It is extracted by petroleum spirit, the residue, after repeated treatment with water, being taken up by absolute alcohol, digested with animal charcoal, and evaporated over sulphuric acid. It is acicular crystalline, very bitter, and nauseous. It is soluble in water, alcohol, chloroform and ether.—Amer. Jour. Pharm., Feb. 1888, 77.

Vernonin.—A new glucoside from *Vernonia nigritiana*. See *Batiator Root* under "Materia Medica."

Pterocarpin and Homopterocarpin.—Two crystalline compounds from *Red Sandal-wood*, which see under "Materia Medica."

Adonidin—Preparation, etc.—See *Adonis vernalis*, L., under "Materia Medica."

Myriocarpin.—A neutral principle from *Cacur* (*cucurbitaceæ*), which see under "Materia Medica."

Cedrine—A New Remedy.—Cedrine, a bitter principle extracted from the seeds of *Simaba Cedron*, Planch., is now an article of commerce. The seeds have been highly valued in New Granada, Colombia, etc., as a remedy against the bites of venomous snakes; also in yellow fever, intermittent fever, and various intestinal troubles. Cedrine is in form of yellowish transparent crystals, easily soluble in water, less so in alcohol. It is extremely energetic and toxical.—Amer. Drugg., May 1888, 83.

COLORING MATTERS.

Indigo—Formation Due to a Peculiar Ferment.—Mr. Albaretz attributes the formation of indigo from the colorless glucoside to the action of a special microbe. He states that if some leaves of the indigo plant be macerated in a little sterilized water, at the end of from twelve to twenty-four hours a pellicle of blue matter appears on the top of the water, an elevation of temperature and evolution of gas being observed at the same time. Upon rupturing the pellicle, indigo is precipitated and a new pellicle is formed, the blue coloring matter being always produced on the surface of the liquid and in contact with air. Upon examining the pellicle under a microscope, it will be seen to consist of a large number of microbes surrounded by delicate crystals of indigo arranged in a peculiar manner. These micro-organisms were separated by the author and demonstrated to be the agents of oxidation. It was found that if a decoction of the leaves was sterilized and then preserved in a Pasteur flask, no indigo was formed, and the reddish color was maintained for several months; but that if a few microbes from a pellicle were added there was an abundant production of indigo in a few hours. The micro-organism, which is easily cultivated in agar-peptone at a temperature of 37° C., is said to closely resemble the microbe of pneumonia and rhinoscleroma, and like them capable of producing pathological effects, while the pneumonia and rhinoscleroma microbes are, on the other hand, capable of producing the indigotic fermentation.—Pharm. Jour. and Trans., Aug. 27, 1887, 173; from Compt. rend., cv., 286.

Indican—Modification of Test for its Presence in Urine.—Mr. L. Renault modifies the test for indican in urine of patients who are taking iodide, as follows: An equal volume of strong hydrochloric acid, together with some chloroform, is added to the urine, followed by a few drops, little by little, of a concentrated solution of chlorinated lime, shaking the tube as long as the color of the chloroform deepens. Any iodine that may have been set free is removed, after the reaction is completed, by dropping a crystal of hyposulphite of sodium in the mixture, which absorbs the free iodine and permits the indigo to reveal its true color.—Pharm. Era, April 1888, 132; from Arch. de Pharm., Feb. 1888.

Carotin—Quantitative Determination.—According to Arnaud, carotin is always found in the leaves of fully developing plants, playing an essential part in their coloration. The accurate determination of the substance is accomplished as follows: 20 grams of the leaves, dried in a partial vacuum, are macerated for ten days in 1 liter of petroleum ether; 100 c.cm. of the filtered extract are evaporated spontaneously in a shallow capsule, and the residue is dissolved in bisulphide of carbon to make exactly 100 c.c. of solution. The color of this solution is red, the intensity being in proportion to the amount of carotin; and this is estimated colorimetrically by comparison with solutions of pure carotin of known strengths. In this manner the amount of carotin was determined to be 79 mg. in 100 g. dry leaves *Spinacea oleracea*, 95 mg. in the same quantity of leaves of *Urtica dioïca*, and 71 mg. in various graminaceous plants. The presence of fat, which is so great a hindrance in the gravimetric method, does not interfere in this at all.—Arch. d. Pharm., Oct. 1, 1887, 882; from Jour. Pharm. Chim., xvi., 129.

Adhatodic Acid.—A yellow coloring matter from *Adhatoda Vasica*, which see under "Materia Medica."

A Volatile Red Coloring Matter has been isolated by Mr. Francis, and subsequently by Prof. E. H. Rennie, from *Drosera Whittakeri*, which see under "Materia Medica."

Hæmatoporphyrin—Preparation and Properties.—Messrs. Nencki and Lieber, in the course of an investigation of the coloring matter of blood, have succeeded in perparing "hæmatoporphyrin" by the action of acetic acid saturated with hydrobromic acid upon crystalline hæmin. It is an unstable compound, isomeric with bilirubin, readily soluble in dilute mineral acids and alcohol, less soluble in ether, amylic alcohol, and chloroform. With hydrochloric acid it forms a salt, crystallizing in rhombic prisms, and with sodium a crystalline compound $C_{16}H_{17}NaN_2O_3.H_2O$. Submitted to the action of tin and hydrochloric acid it is reduced to a coloring matter resembling but not identical with urobilin.—Pharm. Jour. Trans., March 31, 1888, 821; from Pharm. Post, March 25, 1888, 203.

ALBUMINOIDS.

Albumen—Forms in Urine and Tests.—Dr. T. Grainger Stewart enumerates the forms of albumen met with in urine as follows:

I. *Serum albumen*, a substance which, according to Hammarsten, constitutes 4.516 per cent. of the blood serum. It is almost constantly present in urine which contains any variety of albumen. Although a less diffusible body than serum globulin, it is capable of passing through membrane.

II. *Serum globulin* or *Paraglobulin*, the globulin of the blood serum, of which it constitutes 3.103 per cent. It is met with in almost all albuminous urines, its proportion to the serum albumen varying in different instances.

III. *Peptone*, a product of gastric and pancreatic digestion of albuminous substances, also occurring in the process of transformation of tissues and of inflammatory effusions. It is a readily diffusible substance, occasionally met with in the urine in association with or apart from serum albumen.

IV. *Propeptone*, or *Parapeptone*, or *Hemialbumose*, a substance or group of substances intermediate between albumen and peptone, constituting a stage or stages of transformation from the one to the other. It is highly diffusible, and is occasionally met with in the urine under conditions corresponding to those under which peptone occurs. This is the peculiar form of albumen which was discovered in the urine by Dr. Bence Jones in a case of osteomalacia.

V. *Acid albumen*, or *Syntonin*, one of the derived proteids obtained by the action of acids upon albumen. It is easily produced artificially by the addition of acid to albuminous urine, but may occur naturally in certain cases.

VI. *Alkali Albumen*, another derived proteid, produced by the action of alkalies upon albumen. It is readily produced artificially, but is also found naturally in the urine.

VII. *Hæmoglobin*, the combination of hæmatin and globulin naturally existing in the red corpuscles of the blood. It sometimes appears in the urine, particularly in cases of hæmaturia and hæmoglobinuria, also in certain septic conditions, and after inhalation of arseniuretted hydrogen, transfusion of blood, and otherwise.

VIII. *Fibrin*, a proteid substance which does not normally exist as such in the blood. It is met with in the urine in hæmaturia, in some cases of chyluria, and in certain varieties of renal casts.

IX. *Mucin*, the chief constituent of mucus, is a derived proteid substance. It frequently becomes superadded to the urine after secretion, and may be derived from any part of the urinary tract.

X. *Lardacein*, *waxy* or *amyloid material*, familiarly known as a pathological substance within the body, is said to be occasionally demonstrable in renal casts.

Of these ten varieties the last four are of little practical importance—mucin alone being indeed worthy of special comment, and that mainly because of the difficulties which its presence raises in regard to the reliability of certain tests for serum albumen.

As to the tests for the albumen, he puts in tabular form the chief tests for the different varieties of albumen, with their actions upon each variety.

TABLE I.—SHOWING TESTS FOR THE CHIEF FORMS OF ALBUMEN.

	Serum Albumen.	Serum Globulin.	Peptones.	Propeptones.	Acid Albumen.	Alkali Albumen.
Heat.	. . . . . .	. . . . . .	. . . .	. . . .	. . . . .	0
Heat with nitric acid. Heat with acetic acid.	Opacity.	Opacity.	0	0	0	Opacity.
Cold, nitric acid.	Opacity.	Opacity.	0	Opacity dissolved by heat.	Opacity.	Opacity.
Metaphosphoric acid.	Opacity.	Opacity.	Opacity diminished or dissolved by heat.	Opacity diminished or dissolved by heat.	0	Opacity.
Acidulated brine.	Opacity.	Opacity.	Opacity diminished or dissolved by heat.	Opacity diminished or dissolved by heat.	Opacity.	Opacity.
Picric acid.	Opacity.	Opacity.	Opacity dissolved by heat.	Opacity dissolved by heat.	Opacity.	Opacity.
Potassio-mercuric iodide.	Opacity.	Opacity.	Opacity dissolved by heat.	Opacity dissolved by heat.	Opacity.	Opacity.
Potassium ferrocyanide.	Opacity.	Opacity.	0	Opacity dissolved by heat.	Opacity.	Opacity.
Dilution with water.	0	Slight opacity.	0	0	0	0
Magnesium sulph.	0	Opacity.	0	0	Opacity.	Opacity.
Fehling's solution.	Brownish-red or mauve.	. . . . . .	Rose pink or purple.	Rose pink or purple.		
Randolph's test.	. . . . . .	. . . . . .	Yellow opacity.	Yellow opacity.		

Respecting the relative delicacy of the different tests, their application, etc., the author goes into particulars for which reference must be had to the original. The following table shows the results of the tests as to their relative delicacy. The first column shows the dilution up to which the action of each reagent remained distinct; the second shows the percentage of albumen, as calculated from the total quantity in the undiluted fluid and the number of dilutions; and the third shows the grains, or parts of a grain, per ounce, as calculated from the same data:

Table II.—Showing the Comparative Delicacy of Tests for Serum Albumen.

Tests.	Dilutions.	Percentage.	Grains per ounce.
Boiling	300	0.0005	0.00218
Acidulation with acetic acid, and boiling	500	0.0003	0.001311
Cold nitric acid	50	0.003	0.01311
Metaphosphoric acid	500	0.0003	0.001311
Picric acid	1000	0.00015	0.000655
Potassio-mercuric iodide. (Test papers)	500	0.0003	0.001311
Ferrocyanide of potassium	500	0.0003	0.001311

The urine contained albumen to the amount of 1.5 grammes per liter, which is equal to 0.15 per cent., or 0.655 of a grain per ounce.

The results show that the *boiling test*, carefully applied, is an excellent one, revealing the presence of so little as 0.00218 of a grain per ounce, and continuing to show up to the 300th dilution of the standard specimen. But heat, with preliminary acidification with a little acetic acid, was still more delicate, showing 0.001311 of a grain per ounce, and giving a perceptible haziness up to 500 dilutions.—Amer. Jour. Phar., Oct. 1887, 496–503; from Quart. Compend. of Med. Science.

Albumen—Improvement of Fürbringer's Test.—Mr. George John improves Fürbringer's well-known acetic acid and prussiate of potash test, by filling a small test-tube about three-fourths with the *clear* filtered urine, and closing the tube with a cork having two strips of parchment paper inserted, which have been soaked, the one in a concentrated solution of citric acid, the other in a concentrated solution of ferrocyanide of potassium, and then dried. By shaking the tube a little, sufficient of the test will be dissolved to produce the reaction (i. e. a precipitate) if albumen is present.—Drug. Circ., May 1885, 105; from Phar. Ztg.

Albuminoids, Enzymes, etc.—Action of *Formic Aldehyd*, which see under "Alcohols."

Emulsin—Localization in the *Almond*, which see under "Materia Medica."

Myrosin—Evidence of Identity with the Ferments in Cruciferous Seeds in General, which see under "Materia Medica."

Inulin Ferment—Presence in the Jerusalem Artichoke.—Professor J. R. Green contributes a valuable contribution to the knowledge of the vegetable ferments, which effect changes in the reserve material used by plants during germination. Although it has long been known that diastase causes the transformation of starch into sugar, and it has been shown that inulin undergoes similar changes, the presence of the organized ferment causing the change of inulin into sugar has not hitherto been demonstrated. The existence of such a body is now distinctly proved by the elaborate and carefully checked experiments of the author. He has obtained a solution of the ferment free from inulin by means of glycerin, in which inulin is insoluble, but which dissolves the ferment. It differs from diastase in not being able to effect the transformation of starch into sugar. Its origin appears to be zymogen, which exists in tubers (of the Jerusalem artichoke? Rep.), and which when they are submitted to a temperature of 35° C., is transformed into an active ferment. The latter appears first in the tubers when the young stems emerge, and is found where the reserve material is being rendered available for use. By means of an alcoholic solution of orcin, the author has traced the presence of inulin up through the centre of the shoot, and has found it to cease abruptly behind the actively growing zone, not reaching so far as the growing point, while the sugar which accompanies the inulin in its progress was found to extend further forwards towards the growing point. Sugar is not, however, the only product of the action of the ferment on inulin, a body intermediate between inulin and sugar being found in the saccharine solution. This was separated by the use of 82 per cent. alcohol as a precipitant after the removal of the unaltered inulin, which was precipitated by alcohol of 62 per cent. The intermediate body differs from inulin in being more soluble in cold water, in dialyzing more rapidly, and in having a distinct crystalline form. From dextrin, to which the intermediate body may be compared, and which is also precipitated by 82 per cent. alcohol, it differs in giving no reaction with iodine. The activity of the ferment is manifested only in a neutral or faintly acid medium, and is destroyed by prolonged contact with acids or alkalies.—Pharm. Jour. and Trans., April 28, 1888, 904–905; from Ann. Botany, 1888, 223–236.

Organized Ferments—Action of Chloroform Water.—Professor Salkowski has studied the action of chloroform upon some forms of bacilli, and finds that it retards all fermentative processes dependent upon the vital activity of micro-organisms, such as the alcoholic, lactic, and bacterial putrid fermentations; but the action of non-organized ferments was not interfered with by it. Upon the comma bacillus chloroform water acts with extraordinary energy. The author considers that the preservative and disinfective properties of chloroform water might be much more freely utilized in the laboratory, and that it might take the place of glycerine in preparations of pepsin, trypsin, invertin, and in anatomical preparations.—Pharm. Jour. and Trans., June 30, 1888, 1086; from Chem. Rep., June 17, 1888, 166.

Acetic Ferment—Chemical Action.—According to the observations of Brown the chemical action of the acetic ferment—*Bacterium aceti*—is different according to circumstances. If the pure cultured microbes are caused to act upon pure diluted ethyl-alcohol, pure acetic acid is produced; upon a 3 per cent. solution of normal propyl alcohol, propionic acid; by its action upon pure yeast water, or such containing 1 per cent. of methyl alcohol, ammonia and ammonium carbonate are mainly produced, with only traces of butyric acid, and even less formic acid. Towards fermentable sugar the *Bacterium aceti* is perfectly inactive.—Arch. d. Pharm., June 1, 1888, 517; from Jour. de Pharm. et de Chim., 1888, 390.

Lactic Ferment—Occurrence in the Bark of Rhamnus Purshiana.—"*Cascara Sagrada*," which see under "Materia Medica."

Beer Yeast—Presence of a Substance having Specific Action upon Sulphur.—Mr. J. de Rey-Parthade has discovered in beer-yeast a remarkable substance, which has the property of forming sulphuretted hydrogen when in contact with sulphur and alcohol. It is named by the author

Philothion, and is extracted from the yeast by alcohol. This substance has also been detected by him in animal tissues, but in a condition different from that in which it exists in yeast. By its action on sulphur it transforms that element into a soluble compound which can be absorbed by the organism, its action thus affording a parallel to that of hæmaglobin and oxygen.—Pharm. Jour. and Trans., June 30, 1888, 1089; from Compt. rend., cvi. 1683.

Beer Yeast—Medicinal Value.—Dr. Heer arrives at the following conclusions regarding yeast as a medicine, which were arrived at from experiments made at a German prison: (1) Yeast is probably a powerful remedy for zymotic diseases, and in scorbutis and purpura, undoubtedly so. (2) In several cases of well-advanced tuberculosis he has seen it overcome high febrile conditions, followed by a well-established arrest of the solidifying of the lung tissues, which had progressed several months. (3) The exhibition of yeast is very easy; doses up to two liters per day were given without the slightest bad results. (4) The remedy is readily taken by the patient, and replaces the use of milk. (5) By its easy assimilation it becomes a nutrient.—Drugg. Circ., Dec. 1887, 275; from Deut. Med. Ztg.

Fermentation—Influence on Tanning.—It is supposed among tanners that the effect of fermentation is not only useful, but absolutely necessary, during most of the operations in tanning. This opinion is shown to be erroneous in the light of the results of a series of experiments by Messrs.

Collin and Benoist. It was found, in the first place, that the retention of the skins at the slaughter-houses is detrimental, since the putrescent fermentation that is set up in them by bacteria results in the liquefaction of gelatin, which then no longer forms a combination with tannin. Solutions of tannin, in their turn, readily undergo decomposition under the influence of microgerms, this being accelerated and intensified when the skins are added to the tanning liquids in a condition of fermentation. The use of antiseptics was naturally suggested. Some that were experimented with were open to objection on various grounds, but mercuric iodide was found to be effectual, and being required in very small quantity, the authors affirm that its use is not attended with any dangers to the workmen. Its addition prevents the fermentation in the skin, preserves the tanning liquors unaltered, and the leather produced is superior to that produced in the ordinary way.—Pharm. Jour. and Trans., April 28, 1888, 905; from Mon. Scient., April 1888, 499.

Gastric Juice—Determination of Acids.—Dr. Bourget determines the acids present in the gastric juice by the following rapid method. He first examines with litmus paper, to learn whether the liquid is acid or alkaline. Then he ascertains the presence or absence of hydrochloric acid by means of phloroglucin paper. This paper is turned red by hydrochloric acid, but is not acted upon by organic acids. It is prepared by dipping filtering paper into a solution of 2 parts of phloroglucin and 1 part of vanillin in 50 parts of alcohol, and drying rapidly. It indicates as little as 1 in 100,000 parts of acid. After the hydrochloric acid test, he looks for lactic acid by adding one drop of solution of chloride of iron to 10 c.c. of water; on the addition of a liquid containing lactic acid the scarcely perceptible yellowish color turns to a decidedly saffron-like yellow. Butyric acid is detected by the rancid odor.—Drugg. Circ., June 1888, 128; from Schweiz. Wochenschr. f. Pharm.

Digestive Ferments—Independent Activity.—Mr. M. Gross has studied the subject of digestion and of the digestive ferments. After a description of the nature and chemical composition of the subtances to be digested, the author gives the details of some experiments made to determine the functions and activity of the so-called digestive ferments, ptyalin, pepsin, pancreatin and the intestinal juice. Respecting pepsin and pancreatin, his results lead him to the following conclusions:

(1) Pancreatin and pepsin act perfectly independent of each other in the same medium; they lose none of their activity by being caused to act together.

(2) Their activity is ameliorated when kept in a warm or moist condition for a long time; in acid or alkaline solution this diminution of activity is increased.

(3) Pancreatin becomes perfectly inactive if it is digested in too acid a solution for several hours.

(4) Pepsin when digested for several hours in alkaline solution also becomes inactive.

The author's results further show that these two ferments must be used conjointly if the complete effect of artificial digestion is desired.—D. A. Apoth. Ztg., Dec. 15, 1887, and Jan. 1, 1888, 253–254 and 267–269.

Peptic Ferments—Influence of Saccharin.—In view of vague and conflicting statements as to the anti-fermentive character of saccharin, Mr. E. J. Millan records the results obtained with 0.2 per cent. aqueous solution of saccharin upon the following substances:

Pepsin.—The usual B. P. test proportions were taken, one experiment having the saturated solution of saccharin instead of distilled water. Maintained at 54° C. for twenty minutes, little or no difference was observable between them, in each case the albumin having been nearly dissolved. To ascertain the exact relationship, they were both at this stage filtered on tared filters, dried and weighed. The albumin with saccharin solution weighed 16 grains, whilst the normal weighed 13 grains. It is evident, therefore, that saccharin has very little retarding influence over pepsin.

Pancreatin.—The effect of saccharin was tried both with pancreatin upon casein, and also upon starch. In the former no hindrance was effected by saccharin, and even in large proportions it failed to appreciably affect the value and activity of the proteolytic ferment. On starch, however, saccharin was found to interfere very materially with the amylolytic property of the ferment, and ten times the amount of ferment was required; but it was also found that if sodic bicarbonate were present in sufficient amount to neutralize the saccharin, no appreciable retardation took place.

Diastase—Again saccharin showed a distinct retarding action, more than double the quantity of diastatic ferment being required to effect the same amount of conversion of starch as the ferment without saccharin performed. At a meeting of the Manchester Medical Society, Dr. Dreschfeld stated that saccharin increases the diastasic power of malt. This is only true if the saccharin is first neutralized with alkali; the increase then, however, is very slight.

Papain.—Saccharin failed to affect to any marked extent the action of a sample of papain upon moist fibrin. The two experiments, the one with, and the other without saccharin, were stopped before complete conversion had taken place, and the undissolved portion, filtered, dried and weighed, showed a difference of only a few grains against the saccharin experiment.

In view of the increasing uses of saccharin, it is important to note that its antifermentive influence is to a great extent neutralized by the use of alkali, especially when it is employed with the amylolytic ferments: but it hardly seems so essential with the proteolytic ferments.—Phar. Jour. and Trans., Dec. 3, 1887, 471.

Pepsin—Desirability of Raising the Officinal Standard.—Mr. Wm. Harris discusses the officinal preparation of pepsin. He regards the saccharated pepsin as being of insufficient digestive power, the concentrated pepsins of commerce being from 5 to 18 times stronger while being administered in doses of 5 to 10 grains. He is of the opinion that saccharated pepsin should be discarded, the amount of active ingredient largely increased in liquor pepsini, and a standard fixed in the next Pharmacopœia for a pure pepsin, that should digest at least 900 times its weight of coagulated albumen in five or six hours, at a temperature of 105° F.—Proc. Penn. Pharm. Assoc., 1888, 35–36.

Pepsin—Effect of Alcohol on its Digestive Power.—To determine the question whether alcohol exerts any influence on the digestive power of pepsin in solution, Mr. Bardet made a series of experiments, showing that the percentage of alcohol present in solution plays an important part. The presence of 20 per cent. had no influence on the digestive power, but it was very visibly decreased by a larger amount, and entirely destroyed when the amount reached 80 per cent.; thus prescribing pepsin in combination with wine is entirely rational, but combinations of pepsin with tinctures must be avoided.—Pharm. Ztg., 1887, p. 398; Amer. Jour. Pharm., 1887, 560.

Papain—Comparison with Pepsin.—Dr. Finkler gives the results of two series of experiments with pepsin and papain, from which it would seem that papain is more energetic in peptonizing meat than pepsin, while with albumen the pepsin takes precedence provided the solution be dilute. His observations are summed up as follows: Unlike pepsin, its action, begun in the stomach, is continued in the intestine. While pepsin will only act in presence of an acid, papain acts with unvarying energy, be the reaction acid, alkaline or neutral. It dissolves at least 1,000 times its own weight of fresh fibrin. It acts as an antiseptic. In contrast to pepsin, it acts when the resulting peptone solution is highly concentrated, and such action is highly energetic. It is of uniform quality. The conditions under which it changes albumen into peptone are different from those observed for the same effect with pepsin or trypsin. It is harmless and easily tolerated. It acts in presence of other drugs. With its use the possibility of poisoning by ptomaïnes is rendered negative. It improves digestion, stimulates the gastric glands, removes morbid membranes, mucus and pus, and relieves pain and vomiting. Dr. Finkler reports having employed it successfully in dyspepsia, gastric and intestinal catarrh, anorexia, flatulence, alcoholic emesis, anæmia, and for the relief of some of the distressing symptoms of gastric carcinoma and ulcer. The dose is given as from 2 to 5 grains, during meals, with as little liquid as possible.—Drugg. Circ., Nov. 1887, 250; from Lancet, through Med. and Surg. Rep.

Papain—Digestive Activity Compared to that of Pancreatin.—Mr. F. A. Thompson, in view of the high digestive activity that is attributed to papaw juice and its ferment papain, has examined specimens of both obtained from several sources, and compared their activity with a specimen of pancreatin of good quality. The pancreatin in a neutral solution dissolved in eight hours at 104° to 108° F., fifty times its weight of blood fibrin, or 62 times its weight of coagulated egg albumen. In an alkaline medium (containing 0.2 per cent. of bicarbonate of sodium) it dissolved 66 times its weight of the first named, and 70 times its weight of the second named substance. One part of pancreatin was found to be capable of converting 10 parts of starch into sugar in seven minutes at 110° to 118° F., while 5 grains fully peptonized, in an alkaline solution, 1 pint of milk. The papain specimens were, in some cases, wholly inert, and at best dissolved only 2 to at most 5 times their weight of blood fibrin, less of mutton fibre, and scarcely any coagulated albumen.—Pharm. Era, April 1888, 132.

Peptones—Commercial Quality and Value.—According to Redner, the so-called peptones of commerce consist almost wholly of albumoses containing very little true peptone. Peptones are soluble in water and dilute acids, are dialyzable, and are not precipitated by sulphate of ammonium. Albumoses, which represent an intermediate state in the transformation of albuminoids, are not dialyzable, do not give a red color with copper solution and caustic alkali, and are precipitated by sulphate of ammonium. The author does not deny, however, that the commercial peptones have high nutritive value, or that they supply a highly concentrated and easily digested food for invalids, although it is probable that in this respect they differ widely one from another.—Pharm. Era, Jan. 1888, 22.

Peptones—Preparation by Chemical Reaction.—According to Mr. A. Clermont, peptones may be made to have a nutritive as well as a digestive value. To make simply

Nutritive Peptones, he mixes 20 gm. of hashed meat with 30 gm. of water and 50 cgm. of sulphuric acid in a glass tube, which he seals and heats in an oil-bath at 180° C. After cooling, the tube is opened, gaseous products go off, and a light-brown liquid remains, which is filtered and dried, ammoniacal vapors being given off. It is easily re-dissolved in water, and again filtered. The solution so obtained is not precipitated by boiling, or by hydrochloric, nitric or acetic acids; a sufficient quantity of alcohol precipitates it, however, as does also tannin, bichloride of mercury and chloride of platinum. The product from 2 gm. of fresh meat was 4 gm. of peptone. Repeating the experiment without sulphuric acid,

Syntonin was obtained. The solution filters slowly, and gives an abundant precipitate with nitric acid. In slightly acidulated water, syntonin easily passes—under the influence of pepsin—into peptone. Mr. Clermont thinks that syntonin would be of great value in cases of slow digestion.—Amer. Jour. Pharm., Feb. 1888, 99; from Arch. de Pharm., Jan. 5, 1888.

Peptone de Serine—Preparation, etc.—Mr. A. Raymond gives the name "peptone de serine" to a preparation made from blood albumen as described below. He says that while the peptones in use answer for use as peptonates of mercury, iron, etc., they often give so much pain when united to other drugs that their use has to be discontinued. He proposes the following: Albumen from pure blood, 5 gm.; extractive pepsin, dialyzed, 75 centigm.; distilled water, 75 gm.; hydrochloric acid, pure, 19 drops. This is digested for three days at 46° C. The liquid is then clear, and analysis shows it to contain:

Insoluble residuum	0.490
Syntonine	0.125
Dry peptone	3.940
Salts separated by dialysis	0.96

After purification by dialysis, concentration and evaporation by heat, on sheets of glass, this peptone appears as light-colored hygrometric scales. Taken up by distilled water and precipitated by absolute alcohol, a very pure white powder is obtained, which would replace advantageously the peptones of fibrin as having a composition approaching as nearly as possible to that of the blood and having the qualities needed for ready absorption.—Amer. Jour. Pharm., Sept. 1887, 442; from Bull. Gén. de Thérap., July 30, 1887.

Peptones.—Filtration of viscid solutions by the aid of asbestos. See *Filtration* under "Pharmacy."

Pancreas—Use and Preparations.—According to Mr. Engesser, one of the most efficient methods of utilizing the special ferments of the pancreas is to employ this organ in a crude condition or in an aqueous extract, which should be used as soon as possible. A dried pancreas, in powder, can also be prepared of efficient quality. The crude pancreas is employed in form of

Pancreas Paste.—The organ (preferably derived from the hog), which should be as fresh as possible, is deprived of membrane, thoroughly cleansed with a cloth, and carefully freed from fat. It is then scraped with a rather blunt knife or chopped to parts in a chopping-machine, and then rubbed through a hair sieve. It may be preserved for a short time on ice, and is used by adding it to food as such.

Aqueous Pancreas Extract is prepared from the freshly prepared parts by adding ½ pint of water warmed to 36° C. (86° F.) for every pancreas, together with a little common salt, and setting aside for 5 or 6 hours, when the mixture is drained on a hair sieve without pressure. The liquid also must be used fresh, and, while less active than paste, is in some cases preferable.

Powdered Pancreas is readily obtained by reducing the paste in a vacuum apparatus at a temperature of 40° C. (= 104° F.) to an extract, treating this during about 48 hours with absolute alcohol, allowing the latter to drain off, and evaporating the adhering portion at a temperature not exceeding 40° C. The light brown, coarse powder so obtained is very hygroscopic, and must therefore be carefully preserved from dampness. It may be administered in wafers, or with food or water.

Since pancreatic ferments become inert when exposed to a temperature exceeding 45° C. (= 113° F.), the particular food to which any of the above preparations are to be added must have a temperature below that named.—Amer. Drugg., May 1888, 82; from Die Neueren Arzneimittel, 1888.

Pancreatin—Characters and Activity.—Mr. J. Schweitzer contributes a paper on "digestive ferments," in which he confines himself mainly to the action of the pancreatic secretion on fats. He observes, after detailing well known characters of pancreatin, that, while its solutions are quite prone to undergo change, and it requires great care in its preparation, when once dry it keeps well and retains the active principles of the pancreas in a high degree. Its power to convert starch into sugar is as great if not greater than that possessed by the salivary glands; it dissolves fibrin and albumen as readily as pepsin, whilst its property to digest fat is unique. From its triplex digestive power it has been called "tripsine." One grain of pancreatin digests 150 grains of lard, 236 grains of starch, and 25 grains of albumen. One grain of pepsin digests no lard, no starch, and 80 grains of albumen. In his experience with pig's pancreas, which extends over many years, he has with very rare exceptions found the pancreatic secretion acid. Occasionally it was neutral and sometimes even alkaline.—Pharm. Jour. and Trans., Aug. 20, 1887, 149–151.

Diastase—Preparation.—Mr. L. Schärtler prepares pure diastase as follows: Macerate 10 lbs. of ground pale malt, 350 grains of bicarbonate of sodium and 12 to 14 pints of water for two hours at 104° F., draw off the fluid, add 6 or 8 pints more of water, draw off the second fluid after a time, unite the two fluids, heat to 149° F., and strain while hot. To this fluid add twice its volume of strong alcohol, allow the precipitate to subside, draw off the supernatant fluid, re-dissolve the precipitate in a little warm distilled water, and, after filtering or straining, reprecipitate with alcohol. The diastase thus purified is dried on a plate at 122° F., and powdered. The yield is 1 to 1½ per cent. It is important to remove the impurities (matter insoluble or sparingly soluble in water) as speedily as possible, since they consist of very putrescible substances.—Chem. Centralbl. No. 21, 1887; Phar. Era, Nov. 1887, 409.

Milk—Simple Test for Added Water.—Szilasi proposes the following simple test for determining water added to milk, which is based upon the fact that well water always contains more or less nitrates, which, as pointed out by A. W. Hoffman, in 1864, in common with other oxidizing agents, produces a deep blue color with diphenylamine. About twenty minims of solution of sulphate of diphenylamine are placed in a small porcelain vessel, and a few drops of the milk to be examined are added to it. If the milk contain even five per cent. of average well water a blue tinge will gradually distinctly appear. Sulphate of diphenylamine is very cheap, so the test may be readily tried.—Amer. Jour. Pharm., Sept. 1887, 440; from "Lancet," June 1887.

Milk—Changes Produced by Freezing.—Messrs. Kaiser and Schmieder subjected two samples of milk to freezing, the one being frozen slowly, the other quickly, and afterwards partially thawed, and observed the changes. In the former case the ice contained the greater part of the fat, and the fluid portion most of the casein, milk sugar, and salts. In the quickly frozen and partially thawed sample, the fat was distributed equally between the solid and fluid portions. The authors explain this difference by the fat globules rising to the top when the process of freezing is gradual, and they thus become embedded in the ice; while in the quickly frozen samples this cannot take place, and the fat is more evenly distributed. They conclude that milk which has been frozen should, after being well thawed, be shaken up, and that it should never be sold while any ice is visible.—Pharm. Jour. and Trans., Sept. 10, 1887, 216; from Bied. Centr.

Mother's Milk.—Preparation of an excellent substitute, for which see *Extract of Malt* under "Pharmacy."

Kefir—Preparation of a Substitute.—Mr. M. E. Reeb recommends the following method for preparing a substitute for Caucasian "Kefir:" Freshly-soured milk is thoroughly shaken, 2 per cent. of sugar syrup added, and filled in lemonade bottles, which are then securely corked, tied over, and left in a warm place. Fermentation sets in and the kefir is finished in 3 to 4 days. A little citric acid may be added to the syrup to accelerate fermentation. The product is strongly effervescent, has a peculiar bouquet, and contains 2 vol. per cent. of alcohol. Chem. Repert., Dec. 11, 1887, 297; from Jour. de Pharm. d'Als.-Lorr., 1887, 159.

Saccharated Casein—A New Emulsifying Agent.—Attention has already been drawn to the use of casein as an emulsifying agent (see Proceedings, 1887). Further details of the process are now given by Mr. Léger, from which the following may find place here. The first step is the preparation of

Lactoserum.—Heat 1 gallon of cow's milk to 40° C., add 2 fluidounces of water of ammonia, pour the mixture into a separating funnel, or similarly constructed vessel, and allow to stand 24 hours. The lower opalescent liquid constitutes the "lactoserum," and is gently withdrawn from the supernatant layer of butter. From this lactoserum a

Saccharated Casein is prepared as follows: Precipitate the lactoserum from 1 gallon of milk in the cold by means of acetic acid, wash the precipitate by decantation with water between 35° and 40° C., collect it upon a wet strainer and press it. In the resulting cake determine the quantity of dried casein, by drying a weighed portion in a drying oven at 110° C. Now triturate the damp cake of casein with 3½ oz. (parts ?—Rep.) of powdered sugar and with 8 parts of bicarbonate of sodium for every 100 parts of casein calculated as dry. Under the influence of a prolonged trituration and in consequence of the presence of the bicarbonate, the casein swells up and becomes soluble in water. Next, more powdered sugar is gradually added until it amounts to 9 parts for every 100 parts of casein calculated as dry. After the mass has been long and strongly pounded, it acquires the consistence of a lozenge paste, which is divided into small fragments and then dried at a temperature of 25° to 30° C. After complete drying, it is powdered and passed through a sieve, which should not be too fine. The addition of the small portion of sugar to the moist casein is necessary, inasmuch as it facilitates the subsequent addition of more sugar and pulverization, a firm, unmanageable jelly being formed with the bicarbonate alone. The product is permanent. Saccharate of casein is adapted for emulsifying, easily and quickly, all sorts of substances, the resulting emulsions being very stable, and those prepared from oils are perfectly white. The substances which may be emulsified by this new agent, observing only that the proportions of oil, etc., casein and water are never changed, are fatty oils, essential oils, balsams, turpentines, resins, gum resins, and resinous and gum resinous tinctures. Examples of these are given by the author, and will be found under the heading of *Misturæ*, under "Pharmacy."—Amer. Drugg., Sept. 1887, 161; from Bull. Commerc., 1887, No. 7.

APPENDIX

REPORT OF COMMITTEE ON PRIZE ESSAYS, 1887.

The committee on "Prize Essays" finds, after a very careful examination of the various papers presented at the Cincinnati meeting of the Association, that the two contributions made by Edward Kremers, Ph. G., Assistant in the School of Pharmacy of the University of Wisconsin, and entitled "Analysis of the Volatile Oil of Hedeoma pulegioides, Persoon," and "Chemical Examination of the Oil of Andropogon Nardus, L., or Citronella Oil, with a Review of the Different Species of Andropogon of Interest in Pharmacy," are in the judgment of the Committee original and very meritorious contributions to knowledge, involving a vast amount of patient investigation and the expenditure of much time, which is always required in work calling for so many exact determinations. Your Committee, therefore, recommend that the Ebert Prize be given to Mr. Kremers in recognition of his valuable work.

GEO. F. H. MARKOE,
W. W. BARTLET,
LEO ELIEL.

November 30th, moved by Emlen Painter, seconded by J. M. Maisch, and approved by vote of Council, December 7th, 1888:

WHEREAS, The Committee on Prize Essays appointed in September, 1887, was granted further time by the Association at the meeting held in Detroit, for handing in the report on Prize Essays, said report to be referred to the Council; and

WHEREAS, The Report of the Committee received in Philadelphia on November 28, 1888, recommends awarding the Ebert prize for the year 1887 to Edward Kremers, for his essays on the Volatile Oils of Hedeoma pulegioides, and of Andropogon Nardus; therefore,

Resolved 1. That the recommendation of the Committee be approved by the Council.

Resolved 2. That the Permanent Secretary be directed to draw an order upon the Treasurer in favor of Mr. Edward Kremers, for the amount of one year's interest of the Ebert Fund; and

Resolved 3. That the Report of the Committee on Prize Essays, and the action of Council thereon, be published in the Proceedings for 1888.

LIST OF LIFE MEMBERS.

(Names of life members under old constitution in *Italics*, under present by-laws in SMALL CAPITALS.)

Ash, Matthew F.
Baxley, J. Brown.
Berrian, George W.
BIROTH, HENRY.
Blatchford, Eben.
Bullock, Charles.
Burnett, Joseph.
CANNING, HENRY.
Chamberlain, Guilford T.
Colcord, Samuel M.
Cummings, Henry T.
CUTLER, EDWARD WALDO.
Dearborn, George L.
Doliber, Thomas.
DRURY, LINUS D.
Du Puy, Eugene.
EBERT, ALBERT E.
Ellis, Evan T.
Gale, Edwin O.
Gale, William H.
Gallagher, Charles K.
Garrigues, Samuel S.
Goodwin, Wm. W.
Gordon, Wm. J. M.
Grahame, Israel J.
Hale, Frederick.
Haviland, Henry.
Hay, Henry H.
HEINITSH, CHARLES A.
Heintzelman, Joseph A.
Heyl, James B.
HOLZHAUER, CHARLES.
Hudnut, Alexander.
JACQUES, GEORGE W.
Jenks, Wm. J.
JONES, EDWARD C.
JUDGE, JOHN F.
Kent, Robert R.
Kidder, Samuel.
KING, JAMES T.
KLUSSMANN, HERMANN.
Leitch, Arthur.
LEMBERGER, JOSEPH L.
MAISCH, JOHN M.
McConville, Thomas A.
McPherson, George.
Mellor, Alfred.
Melvin, James S.
Metcalf, Theodore.
MILHAU, EDWARD L.
Moffit, Thomas S.
Moith, Augustus T.
Molwitz, Ernest.
Newman, George A.
Niebrugge, John A.
Ollif, James H.
Paine, James D.
Parr, John C.
Patten, I. Bartlett.
Peabody, William H.
Perkins, Elisha H.
Perot, T. Morris.
PFINGST, FERDINAND J.
Rano, Charles O.
REMINGTON, JOSEPH P.
Rittenhouse, Henry N.
Rollins, John F.
Russell, Eugene J.
Saunders, Richard B.
Sharp, Alpheus P.
SHEPPARD, SAMUEL A. D.
Snyder, Ambrose C.
Steele, Henry.
Sweeny, Robert O.
Taylor, Alfred B.
Thompson, William B.
TUFTS, CHARLES A.
Turner, T. Larkin.
Vernor, James.
Wardell, Robert C.
Warner, Wm. R.
Wheeler, Lucien F.
WHITE, AARON S.
WHITFIELD, THOMAS.
Wiegand, Thos. S.
WINKLEMANN, JOHN H.
WOLTERSDORF, LOUIS.
Woodbridge, George W.

ALPHABETICAL LIST OF THE NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED FOR ANNUAL DUES OR CERTIFICATES FROM SEPTEMBER 15, 1887, TO JULY 1, 1888.

		Annual Dues.	Certificates.
Abbott, Frank	'88	$5 00	
Ahlbrandt, Henry E	'88	5 00	
Aird, William	'88	5 00	
Alexander, Maurice W.	'88	5 00	
Allen, Albert W	'86–87	10 00	
Allen, William H	'87	5 00	
Aman, Henry	'88	5 00	
Anderson, Samuel	'88	5 00	
Andrews, Josiah H	'88	5 00	
Andriessen, Hugo	'88	5 00	
Armstrong, Andrew M.	'88	5 00	
Ashbrook, Charles S	'87	5 00	
Aspinall, Walter A.	'88	5 00	
Atwood, Luther L	'87	5 00	
Babo, Leopold	'88	5 00	
Bailey, Frederick	'88	5 00	
Bain, Andrew W.	'88	5 00	
Baker, Edwin	'88	5 00	
Baker, T. Roberts	'88	5 00	
Ball, Charles E	'88	5 00	
Ballard, John W	'88	5 00	
Baltzley, Zachariah T	'88	5 00	
Bartlet, William W	'87	5 00	
Bassett, Charles H	'88	5 00	
Bassett, Joseph	'88	5 00	
Bauer, Louis G	'87	5 00	
Baumgartner, Frederick	'85–86–87	15 00	
Baur, Jacob	'88	5 00	
Bayliss, Lewis F.	'88	5 00	
Beach, Clifton H	'85–86–87–88	20 00	
Bechmann, Charles R	'88	5 00	
Becker, Charles	'87	5 00	
Beckett, Frederick A	'88	5 00	
Beckwith, Edw. R	'87	5 00	
Bedford, P. Wendover	'88	5 00	
Belt, Z. James	'88	5 00	
Bendiner, Samuel J	'87	5 00	
Benedict, Willis	'88	5 00	
Benjamin, James H	'88	5 00	
Best, John	'88	5 00	
Betz, Otto E	'87–88	10 00	$5 00
Beyschlag, Charles	'88	5 00	
Billings, Henry M.	'87	5 00	
Bingham, Charles C	'87	5 00	
Bishop, Francis M	'88	5 00	
Bissell, Emery G.	'88	5 00	
Bissell, John G.	'88	5 00	
Blaikie, William	'88	5 00	
Blair, Andrew	'88	5 00	
Blair, Henry C.	'88	5 00	
Blake, James E	'88	5 00	
Blanding, William B	'88	5 00	
Blank, Alois	'88	5 00	
Bodemann, Wilhelm	'87	5 00	
Boehm, Solomon	'88	5 00	
Amount carried forward		$310 00	$5 00

		Annual Dues.	Certificates.
Amount brought forward		$310 00	$5 00
Boerner, Emil L.	'85–86–87	15 00	
Boggs, Edwin L	'88	5 00	
Bohl, Conrad	'88	5 00	
Bolles, William P	'88	5 00	
Bond, John B	'87	5 00	
Bond, Sterling P	'87	5 00	
Boring, Edwin M	'87	5 00	
Boyd, Geo. W.	'87	5 00	
Bacon, Gaston E.	'87	5 00	7 50
Boyden, Edward C.	'88	5 00	
Boynton, Herschell	'87	5 00	
Brack, Charles	'88	5 00	
Brackett, Aurick S.	'88	5 00	
Bristol, Charles E	'88	5 00	
Brooks, Geo. W.	'88	5 00	
Brown, Henry J.	'88	5 00	
Bruck, Philip H	'88	5 00	
Brunswig, Lucien N	'87	5 00	7 50
Bryant, William C	'88	5 00	
Bullock, Charles	'88	5 00	
Bunker, Elihu	'88	5 00	
Buntin, William C	'87	5 00	
Burrough, Horace	'88	5 00	
Burroughs, Silas M	'84–85–86–87	0 00	
Bury, Edward B.	'87	5 00	
Bush, William	'88	25 00	
Butler, Charles H	'88	5 00	
Butler, Freeman H.	'88	5 00	
Caffee, Amos H	'87	5 00	
Calder, Albert L.	'88	5 00	
Calvert, John	'88	5 00	
Carpenter, Samuel W.	'86–87	0 00	
Carrell, Eugene A	'87	5 00	
Carslake, George M	'88	15 00	
Carter, Solomon	'88	5 00	
Caspari, Charles, Jr	'88	5 00	
Casper, Thomas J.	'88	5 00	
Catlin, Ephron	'88	5 00	
Chandler, Charles F.	'88	5 00	
Chapin, Fred. H.	'88	5 00	
Chapin, William A.	'88	5 00	
Chapman, Isaac C	'87	5 00	
Choate, John	'88	5 00	
Christiani, Charles	'87	5 00	
Church, Howard M	'87	5 00	
Clark, Frank P	'85–86–87	5 00	
Clarke, William B.	'87–88	0 00	
Clement, Henry B.	'88	15 00	
Coblentz, Virgil	'88	15 00	
Cole, Howson W.	'88	5 00	
Collins, Albert B.	'88	5 00	
Cone, John W.	'88	5 00	
Conger, Frederick A.	'87	5 00	7 50
Conrad, John	'87	5 00	
Amount carried forward		$625 00	$27.50

	Annual Dues.	Certificates.
Amount brought forward	$625 00	$27 50
Conrath, Adam. . . . . '88	5 00	
Coon, Harry C. . . . . '88	5 00	
Coon, James V. D. . . . . '87	5 00	
Cotton, William H. . . . . '86–'87–'88	15 00	
Cowing, Geo. H . . . . '88	5 00	
Cramer, Max . . . . '88	5 00	
Crenius, Frank M. . . . . '88	5 00	
Crowther, Frederick A. . . '87–88	10 00	
Culbreth, David M. R. . . . . . '88	5 00	
Cummins, Charles H . . . . '88	5 00	
Cutts, Foxwell C., Jr. . . . . . '88	5 00	
Dadd, John A. . . . . '88	5 00	
Dalrymple, Chas. H. . . . . . . '88	5 00	
Dana, Edmund, Jr. . . . . '88	5 00	
Danforth, Edmund C . . . . . . '88	5 00	
Daniels, Samuel O . . '84–85–86–87	20 00	
Davenport, Bennett F . . . . . . '87	5 00	
Davis, Benjamin . . . . '88	5 00	
Davis, Edward H . . . . '88	5 00	
Davis, Geo. R . . . . '86–87	10 00	
Davis, Wm. M . . . . '88	5 00	
Dawson, Edward S., Jr. . . . . . '88	5 00	
Dawson, John H. . . . . '88	5 00	
Day, Carlos E . . . . '88	5 00	
De Cou, James C. . . . . . . '86–87	10 00	
De Forest, William P. . . . . . '88	5 00	
De Graff, David . . . . '86–87	10 00	
De Lang, Alfred . . . . '88	5 00	
Denham, Charles S. . . . . '88	5 00	
Dennin, Charles . . . . '88	5 00	
Devine, John. . . . . '87–88	10 00	7 50
Dewoody, William L. . . . . . . '88	5 00	
Dick, Dundas . . . . '88	5 00	
Dikeman, Nathan . . . . '87	5 00	
Dill, J. Byron . . . . '87	5 00	
Ditman, Andrew J. . . . . '88	5 00	
Dohme, Charles E. . . . . '88	5 00	
Dohme, Louis . . . . '88	5 00	
Douglass, Henry, Jr. . . . . . . '88	5 00	
Downing, Benjamin F., Jr. . '87–88	10 00	
Drake, Charles W. . . . . . . '86–87	10 00	
Drake, John R. . . . . '88	5 00	
Driggs, Charles M . . . . '88	5 00	
Duckett, Walter G. . . . . '87	5 00	
Dunn, John A. . . . . '88	5 00	
Durand, Sebastian C . . . . '84	5 00	
Durkee, William C. . . . . '88	5 00	
Easton, Luther W. . . . . '88	5 00	
Eberbach, Ottmar. . . . . '88	5 00	
Eberle, Charles L . . . . . . '86–87	10 00	
Eccles, Robert G. . . . . '88	5 00	
Eckford, Jas. W. . . . . '88	5 00	
Eddy, Henry C. . . . . '87	5 00	
Edwards, Nathan W. . . . . '86–87	10 00	
Edwards, Wm. F. . . . . '88	5 00	
Eger, George . . . . '88	5 00	
Eimer, Charles . . . . '88	5 00	
Elfers, Joseph C. . . . . '88	5 00	
Elliott, Henry A. . . . . '88	5 00	
Emerson, Charles B. . . . . . '86-87	10 00	
Emich, Columbus V. . . . . '88	5 00	
Estes, Joseph J. . . . . '88	5 00	
Evans, Samuel B. . . . . '87	5 00	
Fairchild, Benjamin F. . . . . . '88	5 00	
Fairchild, Samuel W. . . . . . '87–88	10 00	
Feemster, Joseph H . . . . '88	5 00	
Fennel, Chas. T. P. . . . . '88	5 00	
Field, Amos . . . . '86–87	10 00	
Finlay, Alexander K. . . . . . . '87	5 00	
Finlay, John P. . . . . '85–86–87	15 00	
Finnerty, Edward J., Jr. . . . . '88	5 00	
Fleck, Jacob J. . . . . '88	5 00	
Fleischmann, August T. . . . '86–87	10 00	
Ford, Charles M. . . . . '88	5 00	
Foster, William O. . . . . '88	5 00	
Fox, Daniel S. . . . . '88	5 00	
Frames, James P. . . . . '88	5 00	
Amount carried forward	$1110 00	$35 00

	Annual Dues.	Certificates.
Amount brought forward	$1110 00	$35 00
Francis, Walter R. . . . . '88	5 00	
Franklin, Philip H. . . . . '88	5 00	
Fraser, Herman E . . . . '87	5 00	
French, William B. . . . . '88	5 00	
Frere, Alexander G. . . . '85–86–87	15 00	
Frye, George C. . . . . '88	5 00	
Gates, Amasa O. . . . . '87	5 00	
Gaus, Charles H. . . . . '88	5 00	
Gaus, Louis H. . . . . '88	5 00	
Gessner, Emil A. . . . . '88	5 00	
Gibson, Charles . . . . '88	5 00	
Gibson, James E. . . . . '88	5 00	
Gill, George . . . . '88	5 00	
Godbold, Fabius C. . . . . '87	5 00	
Godding, Edward R. . . '85–86–87	15 00	
Godding, John G. . . . . '88	5 00	
Gould, James M. . . . . '88	5 00	
Goodale, Harvey G. . . . . . '86–87	10 00	
Goodman, Emanuel . . . . '88	5 00	
Goodrich, Stephen. . . . . '88	5 00	
Goodwin, Lester H. . . . . '88	5 00	
Gosman, Adam J. . . . . '38	5 00	
Graham, Willis H. . . . . '88	5 00	
Grandjean, Charles . . . . '88	5 00	
Grandjean, Eugene . . . . '88	5 00	
Gray, Gilbert D. . . . . '86–87	10 00	
Gray, Henry R. . . . . '88	5 00	
Gregory, Edmund . . . . '88	5 00	
Greve, Charles M. . . . . '87	5 00	
Greve, Theodore L. A. . . . . . '88	5 00	
Greyer, Julius. . . . . '88	5 00	
Griffith, Hiram E. . . . . '87	5 00	
Grosvenor, Daniel P. . . . . '86–87	10 00	
Haass, G. Herman . . . . '88	5 00	
Hadley, Frank R. . . . . '88	5 00	
Hall, Charles K. . . . . '87	5 00	
Hall, Edwin B. . . . . '88	5 00	
Hall, Marshall C. . . . . '88	5 00	
Hancock, John F. . . . . '84	5 00	
Hanson, Willis T. . . . . '87	5 00	
Hardin, John H. . . . '84–85–86–87	20 00	
Harlow, Noah S. . . . . '88	5 00	
Harrison, Jacob H. . . . . '88	5 00	
Hassebrock, Henry F, ... '88	5 00	
Hassinger, Sam'l E. R. . . . . . '87	5 00	
Hatch, Eugene F. . . . . '85–86–87	15 00	
Hattenhauer, Robert C. . . . . '88	5 00	
Hatton, Edgar M. . . . . '88	5 00	
Hawkins, M. Smith . . . . '88	5 00	
Haynes, David O. . . . . '88	5 00	
Heinemann, Otto . . . . '88	5 00	
Hemm, Francis . . . . '88	5 00	
Hening, James C. . . . . '87	5 00	
Henry, Charles (Dworniczak) . '88	5 00	
Hepburn, John. . . . . '86–87	10 00	
Herbst, Frederick W. . . . . . . '88	5 00	
Heydenreich, Emile . . . . '88	5 00	
Higgins, James S. . . . . '88	5 00	
Hildreth, Newton G. . . . . . . '88	5 00	
Hodgkins, Israel M. . . . . '88	5 00	
Hoffman, Julius . . . . '88	5 00	
Hoffman, Otto L . . . . '88	5 00	
Hoffmann, Frederick . . . . '88–89	10 00	
Hohley, Charles . . . . '88	5 00	
Holmes, Clayton W. . . . . '88	5 00	
Homer, John.	. . . .	5 00
Hood, Charles I. . . . . '88	5 00	
Horn, Wilbur F. . . . . '86–87	10 00	
Howson, Arthur B. . . . . '88	5 00	
Howson, Walter H. . . . . '88	5 00	
Hubbard, John H. . . . . '88	5 00	
Huber, Jacob C. . . . . '87	5 00	
Huested, Alfred B. . . . . '88	5 00	
Huhn, George . . . . '86–87	10 00	
Hurty, John N. . . . . '87	5 00	
Huston, Charles . . . . '88	5 00	
Hutchins, Isaiah . . . . '88	5 00	
Amount carried forward	$1570 00	40 00

	Annual Dues.	Certificates.
Amount brought forward	$1570 00	$40 00
Hyler, William H. . . . ’85–’86–’87	15 00	
Inglis, Frank . . . . ’87	5 00	
Inman, Charles T . . . . ’88	5 00	
Irvin, William A. . . . . ’88	5 00	
James, George R. . . . . . ’86–’87	10 00	
James, William T . . . . . ’86–’87	10 00	
Jennings, N. Hynson . . . . . ’88	5 00	
Jesson, Jacob . . . . ’86–’87	10 00	
Johnson, Charles B . . . . ’88	5 00	
Johnston, Harry A . . . . . ’86–87	10 00	
Jones, Alexander H . . . . . . ’88	5 00	
Jones, Daniel S . . . . ’88	5 00	
Jones, James T . . . . . . ’87–’88	10 00	
Jones, Samuel S. . . . . ’88	5 00	
Jones, Thomas . . . . ’88	5 00	
Jordan, F. Francis ’83–’84–’85–’86–’87	25 00	
Joy, Edwin W. . . . . ’88	5 00	
Jungkind, John A. . . . . . . ’87	5 00	
Kalish, Julius . . . . ’88	5 00	
Kanal, Emmet . . . . ’87	5 00	
Karb, Geo. J . . . . ’88	5 00	
Karrman, William. . . . . . ’88	5 00	
Kauffman, Geo. B. . . . . . . ’88	5 00	
Keasbey, Henry G . . . . . . ’88	5 00	
Keeler, William H. . . . . ’86–’87	10 00	
Keeney, Caleb R. . . . . ’88	5 00	
Kelley, Edward S . . . . ’88	5 00	
Kellogg, Gardner . . . . ’87	5 00	
Kennard, Frank B . ’84–’85–’86–’87	20 00	
Kennedy, Ezra J. . . . . ’87	5 00	
Kennedy, James. . . . . ’88	5 00	
Kent, Henry A., Jr . . . . . . ’87	5 00	
Kephart, Henry. . . . . ’87	5 00	
Keys, Roger. . . . . ’88	5 00	
Kienth, Hans . . . . ’88	5 00	
Kilmer, Frederick B . . . . . . ’87	5 00	
Klayer, Louis . . . . ’88	5 00	
Klie, G. H. Chas . . . . ’88	5 00	
Klump, Charles C . . . . . ’87–’88	10 00	
Knock, Thomas T. . . . . . . ’88	5 00	
Knoebel, Edmund. . . . . . . ’88	5 00	
Koch, Louis. . . . . ’88	5 00	
Koehnken, Herman H. . . . . ’88	5 00	
Krehe, J. Theodore . . . . . . ’88	5 00	
Krieger, Philip . . . . ’88	5 00	
Kurfurst, Henry F. . . . . . . ’88	5 00	
Lambert, John A. . . . . ’87	5 00	
Lancaster, Edwin W. . . . ’86–’87	10 00	
Land, R. H. ’82–’83–’84–’85–’86’-87	30 00	
Lawton, Charles H . . . . . . ’88	5 00	
Lawton, Horace A. . . . . . . ’88	5 00	
Lazell, Lewis T. . . . . ’88	5 00	
Lee, James A. . . . . ’88	5 00	
Leith, Harvey I. . . . . ’88	5 00	
Lengfeld, Abraham L . . . . . ’88	5 00	
Libby, Henry T. . . . . ’87	5 00	
Lilly, Eli . . . . ’87	5 00	
Livingston, Barent V. B . . . . ’88	5 00	
Llewellyn, John F. . . . . ’86–’87	10 00	
Lloyd, John U. . . . . ’88	5 00	
Lockhart, Geo. B. . . . . . . ’87	5 00	
Lowd, John C. . . . . ’88	5 00	
Luscomb, Wm. E. . . . . . . ’88	5 00	
Lyman, Asahel H. . . . . . . ’87	5 00	
McCarthy, Cornelius J. . . . . ’87	5 00	
McClure, Archibald . . . . . . ’88	5 00	
McClure, William H. . . . . . ’88	5 00	
McElhenie, Thomas D. . . . . ’88	5 00	
McIntyre, Byron F. . . . . ’85–’86	10 00	
McIntyre, Ewen. . . . . ’88	5 00	
McIntyre, William. . . . . . . ’88	5 00	
McKelway, Geo. I. . . ’86–’87–’88	15 00	
McNeil, John M. . . . . ’88	5 00	
Macdonald, Daniel T. . . . . . ’88	5 00	
Main, Thomas F. . . . . ’87	5 00	
Maisch, Henry C. C. . . . . . ’88	5 00	
Majer, Oscar . . . . ’88	5 00	
Amount carried forward	$2085 00	$40 00

	Annual Dues.	Certificates.
Amount brought forward . . .	$2085 00	$40 00
Major, John R. . . . . ’87	5 00	
Mallinckrodt, Edward. . . . . ’88	5 00	
Markoe, Geo. F. H . . . . . . ’88	5 00	
Martin, Emil . . . . ’87	5 00	
Martin, William J. . . . . . . ’88	5 00	
Masi, Frederick H. . . . . . . ’87	5 00	
Mason, Alfred H. . . . . ’88	5 00	
Masters, Robert S. . . . . . . ’87	5 00	
Mattison, Richard V. . . . . . ’88	5 00	
May, James O. . . . . ’87	5 00	
Meininger, Albert . . . . ’88	5 00	
Meyer, Christian F. G. . . . . ’88	5 00	
Meyers, Jas. A. . . . . ’87	5 00	
Michaelis, Gustavus. . . . . . ’88	5 00	
Milburn, John A. . . . . ’87	5 00	
Milburn, Washington C . . . . ’87	5 00	
Miller, Adolphus W . . . . . . ’88	5 00	
Miller, Jason A . . . . ’88	5 00	
Miller, Joseph G. . . . . ’88	5 00	
Miville, Francis C. . ’84–’85–’86–’87	20 00	
Moody, Richard H. ’84–’85–’86–’87	20 00	
Morley, William J. . . . . . . ’88	5 00	
Morris, Lemuel I. . . . . ’87	5 00	
Mott, George F. . . . . . . ’86–’87	10 00	
Mowry, Albert D. . . . . . ’87–’88	10 00	
Mueller, Adolphus. . . . . . . ’88	5 00	
Mueller, Louis H. . . . . . ’86–’87	10 00	
Munson, Luzerne J. . . . . . . ’87	5 00	
Nattans, Arthur. . . . . ’87	5 00	
Niblo, William H.	. . . .	5 00
Nipgen, John A. . . . . ’88	5 00	
O’Brien, James J . . . . ’87	5 00	
Ohliger, Lewis P. . . . . . ’86–’87	10 00	
Orne, Joel S. . . . . ’88	5 00	
Ottinger, James J . . . . ’88	5 00	
Owens, James A. . . . . ’88	5 00	
Owens, Richard J. . . . . . . ’88	5 00	
Parcher, Geo. A. . . . . ’88	5 00	
Parker, George H. . . . . . . ’88	5 00	
Parker, John H . . . . ’87	5 00	
Patch, Edgar L . . . . ’88	5 00	
Patton, John F. . . . . ’88	5 00	
Pauley, Frank C. . . . . ’88	5 00	
Pease, Francis M . . . . ’88	5 00	
Peck, Geo. L . . . . ’88	5 00	
Perkins, Benj. A. . . . . ’88	5 00	
Perkins, William A . . . . . . ’88	5 00	
Perry, Frederick W. R. . . . . ’87	5 00	
Pettengill, Edward T. . . . . . ’87	5 00	
Pettit, Henry M. . . . . ’88	5 00	
Phillips, Charles W . . . . . . ’88	5 00	
Pickett, John H . . . . . . ’87–’88	10 00	
Pierce, William H. . . . . . . ’88	5 00	
Pile, Gustavus . . . . ’88	5 00	
Pilsbury, Frank O. . . . . . . ’88	5 00	
Plummer, David G. . . . . . . ’87	5 00	
Porter, Henry C. . . . . ’88	5 00	
Potterfield, Clarence A. . . . . ’88	5 00	
Powell, Robert B . . . . ’88	5 00	
Power, Frederick B . . . . . . ’88	5 00	
Prescott, Albert B . . . . ’88	5 00	
Preston, Calvin W. . . ’86–’87–’88	15 00	
Preston, David . . . . ’88	5 00	
Prieson, Adolph. . . . . ’88	5 00	
Procter, Wallace . . . . ’88	5 00	
Pursell, Howard. . . . . ’87	5 00	
Pyle, Cyrus. . . . . ’88	5 00	
Quackinbush, Benj. F . . . . . ’88	5 00	
Randall, Geo. D. . . . . . ’86–’87	10 00	
Rapelye, Charles A . . . . . . ’88	5 00	
Reed, Isaac N. . . . . ’88	5 00	
Reiss, Edward C. . ’84–’85–’86–’87	20 00	
Rendigs, Charles P. . . . . . . ’88	5 00	
Reusch, Ernst. . . . . ’88	5 00	
Reynolds, Howard P. . . . . . ’88	5 00	
Reynolds, William K. . . . . . ’88	5 00	
Rhoades, Stephen H. . . . . . ’88	5 00	
Amount carried forward	$2540 00	$45 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward	$2540 00	$45 00	Amount brought forward	$3060 00	$55 00
Rhode, R. E '87	5 00		Snow, Chas. W '88	5 00	
Richardson, Frank '87	5 00		Snyder, Robert J. '87	5 00	
Richardson, James '88	5 00		Sombart, John E. '88	5 00	
Richardson, J. Clifford '88	5 00		Spalding, Warren A '88	5 00	
Richardson, William A '88	5 00		Sperry, Herman J '88	5 00	
Rickey, Charles F. '88	5 00		Squibb, Edward H. '88	5 00	
Riddell, James A. '84-85-86-87	20 00		Squibb, Edward R. '88	5 00	
Ridgway, Lemuel A '86	5 00	5 00	Stahler, William '88	5 00	
Riesenman, Joseph '87	5 00		Stahlhuth, Ernst H. W. '88	5 00	
Robbins, Alonzo '88	5 00		Staley, Michael C '87	5 00	
Roberts, Daniel J. '87-88	10 00		Stam, Colin F '87	5 00	
Robin, Oscar '87	5 00		Steele, James G '88	5 00	
Rogers, Arthur H '84-85-86-87	20 00		Stein, Jacob H. '88	5 00	
Rogers, William H. '88	5 00		Stevens, Alonzo B. '88	5 00	
Ronde, Claus F '88	5 00		Stewart, Francis E. '87	5 00	
Ronnefeld, Theodore '88	5 00		Stowell, Daniel '88	5 00	
Rosengarten, Mitchell G '88	5 00		Strachan, William '88	5 00	
Ross, Ellison H '85-86-87	15 00		Sweet, Abel S., Jr. '88	5 00	
Ross, William H '87	5 00		Sweet, Caldwell '88	5 00	
Roth, Eugene N '86-87	10 00		Sweet, William S. '87	5 00	
Rudolf, Mrs. Eliza '87	5 00	5 00	Tartis, Alfred J '88	5 00	
Ruete, Theodore W '86-87	10 00		Taylor, James H. '87-88	10 00	
Runyon, Edward W. '88	5 00		Taylor, John P '88	5 00	
Ruppert, John '88	5 00		Test, Alfred W. '87	5 00	
Rust, William '88	5 00		Thompson, Edw. W. '88	5 00	
Ryerson, Henry O '88	5 00		Thompson, William S '87	5 00	
Sappington, Richard A. '85-86-87	15 00		Thompson, William S '88	5 00	
Sauer, Louis W '88	5 00		Thomsen, John J. '88	5 00	
Sauerhering, Rudolph '88	5 00		Thomsen, John J., Jr '88	5 00	
Saunders, William '87-88	10 00		Thorn, Henry P '88	5 00	
Sautter, Louis '88	5 00		Tiarks, Hermann '88	5 00	
Sawyer, William F '88	5 00		Tilyard, Charles S '88	5 00	
Schaaf, Justus H '88	5 00		Todd, Albert M '88	5 00	
Schafhirt, Adolph J '87	5 00		Tomfohrde, John W '88	5 00	
Scherff, John P '88	5 00		Topley, James '88	5 00	
Schermerhorn, Winfield S '88	5 00		Torbert, Willard H '87-88	10 00	7 50
Schlaepfer, Henry J. '88	5 00		Trask, Charles M '88	5 00	
Schmidt, Florian C. '87	5 00		Treat, Joseph A. '88	5 00	
Schmidt, Valentine '87-88	10 00		Trimble, Henry '88	5 00	
Schmitt, Joseph M. '88	5 00		Turner, George H. '88	5 00	
Schrader, Henry '87	5 00		Tuska, David '87	5 00	
Schranck, C. Henry '88	5 00		Ude, George '88	5 00	
Schreck, Leo S. '88	5 00		Uhlich, Ferdinand G '88	5 00	
Schueller, Ernst '88	5 00		Van Auken, Jerrie A. '87	5 00	
Schueller, Frederick '88	5 00		Viallon, Paul L '86-87	10 00	
Schofield, James S '86-87	10 00		Vilter, Herman '88	5 00	
Scott, George T '88	5 00		Vordick, August H '88	5 00	
Scott, William H. '88	5 00		Voss, George W. '88	5 00	
Seabury, Geo. J '88	5 00		Wagner, Henry '88	5 00	
Sedberry, Bond E '88	5 00		Wahmhoff, Julius H '86-87	10 00	
Sennewald, Ferdinand W '88	5 00		Walker, Anselle '88	5 00	
Serodino, Herman '88	5 00		Walker, John P. '88	5 00	
Sevin, N. Douglas. '88	5 00		Walker, William J. '88	5 00	
Sharples, Stephen P '88	5 00		Wall, Otto A '88	5 00	
Shaw, Robert J '88	5 00		Walton, Harry C. '88	5 00	
Shedd, Edwin W. '87	5 00		Walton, Joseph R '87	5 00	
Sherwood, Louis W '88	5 00		Wangler, Conrad D '88	5 00	
Shinn, James T '88	5 00		Warder, Robert '87	5 00	
Shoemaker, Richard M '88	5 00		Warn, William E '88	5 00	
Shrader, John L '86-87	10 00		Warne, Henry L '84-85	10 00	
Shreve, John A. '87-88	10 00		Watson, William H '87	5 00	5 00
Shurtleff, Israel H. '88	5 00		Waugh, Geo. J '87	5 00	
Siegemund, Charles A '88	5 00		Webb, William H .88	5 00	
Siegenthaler, Harvey N '88	5 00		Webber, J. LeRoy '87-88	10 00	
Simms, Giles G. C. '87	5 00		Weber, William. '86-87	10 00	
Simon, William '88	5 00		Wehrley, Thomas M. '87	5 00	
Simonson, William '88	5 00		Weichsel, Franz. '88	5 00	
Simpson, William '84	5 00		Weiser, Emilius I '88	5 00	
Sitton, Charles E '88	5 00		Wellcome, Henry S '88	5 00	
Sloan, George W. '87	5 00		Wells, Jacob D '88	5 00	
Slocum, Frank L. '85-86-87	15 00		Wells, Romanta '88	5 00	
Smick, William H. R. '87-88	10 00		Wenzell, William T '88	5 00	
Smith, Edward N '88	5 00		Westmann, F. H. '88	5 00	
Smith, J. Hungerford '87	5 00		Weusthoff, Otto S '88	5 00	
Smith, Joseph S. ,84-85-86-87-88	25 00		Weyer, John '88	5 00	
Smith, Linton '88	5 00		Wheeler, Leonard H. '88	5 00	
Sniteman, Chas. C. '88	5 00		Whelpley, Henry M. '88	5 00	
Forward	$3060 00	$55 00	Forward	$3480 00	$67 50

		Annual Dues.	Certificates.
Amount brought forward		$3480 00	$67 50
White, George H.	'88	5 00	
Whiting, Frederick T	'88	5 00	
Whitney, Henry M	'88	5 00	
Wichelus, Frederick	'88	5 00	
Wilcox, Frederick	'87	5 00	
Wilkes, Arthur P	'87	5 00	
Williams, Duane B	'88	5 00	
Williams, John K	'88	5 00	
Williams, Richard W	'88	5 00	
Wilson, Albert H.	'84-85-86-87	20 00	
Wilson, Benj. O	'88	5 00	
Winslow, Edwin C.	'88	5 00	
Winter, Jonas	'88	5 00	
Forward		$3560 00	$67 50

		Annual Dues.	Certificates.
Amount brought forward		$3560 00	$67 50
Wohlfarth, Justin	'88	5 00	
Wolfe, Nathaniel	'86-87	10 00	
Wood, Edward S.	'88	5 00	
Woodruff, Roderick S	'87	5 00	
Wright, Edward E.	'88	5 00	
Yorston, Matthew M.	'88	5 00	
Zeilin, John H.	'88	5 00	
Zellhoefer, George	'88	5 00	
Ziegler, Philip M.	'88	5 00	
Zimmerman Charles	'86-87-88	15 00	
Zuenkeler, John F.	'88	5 00	
Zwick, George A.	'88	5 00	
Total		$3635 00	$67 50

NOTE.—For list of payments received by the Treasurer between July 1, 1887, and Sept. 15, 1887, see Proceedings 1887, pp. 638 to 640, where amounts accounted for are annual dues $1770, and for certificates $87.50. Compare with Treasurer's report in present volume, page 24. See also resolution of Council on page 39, and Rule 12 of General Rules of Finance.—EDITOR.

LIST OF NEW MEMBERS.

1. *Delegates becoming members.*

Arthur Bassett, Detroit, Mich
Wm. E. Cates, Providence, R. I.
J. E. D'Avignon, Windsor, Ont., Can.
Oscar C. Dilly, Louisville, Ky.
Adolph T. Fleischer, Chicago, Ill.
Richard C. Foerksen, Chicago, Ill.
H. Otto Haeusgen, Louisville, Ky.
Wm. A. Hall, Greenville, Mich.
F. W. Hancock, New Berne, N. C.
H. L. Haussamen, Grafton, Dakota.
T. N. Jamieson, Chicago, Ill.
Jos. M. Labold, Devil's Lake, Dakota.
Otto E. Mueller, Louisville, Ky.
W. A. Puchner, Chicago, Ill.
C. H. T. Rohlfing, St. Louis, Mo.
Henry Smith, Decatur, Ill.
Jas. L. Thompson, Nashville, Tenn.
Albert Wetterstroem, Cincinnati, O.
Alvin A. Yeager, Knoxville, Tenn.

2. *Members by proposition and election.*

Samuel Aubley, Scottdale, Pa.
Jacob S. Beetem, Wilmington, Del.
Paul J. Behrens, Chicago, Ill.
Wm. W. Beitemann, Denver, Col.
W. M. Benton, Peoria, Ill.
Chas. Henry Bernhard, Madison, Wis.
Will. Jay Berringer, Pleasantville, Ia.
Herbert George Biddle, Cleveland, O.
Charles Scott Bondurant, Thomasville, Ga.
Elmer E. Bostick, Philadelphia, Pa.
Erick Brand, New Orleans, La.
James Brown, Jersey City, N. J.
Fred Brundage, Muskegon, Mich.
John D. Burg, Philadelphia, Pa.
Isaac Eugene Chandler, Denver, Col.
Charles Mowry Cole, Newport, R. I.
Chas. S. Commings, Schuylkill Haven, Pa.
John D. Copeland, Antigonishe, Nova Scotia.
Ed. A. Craighill, Lynchburg, Va.
Thomas D. Crawford, Oxford, N. C.
John T. Davison, Denver, Col.
Chas. J. Deitz, New York.
Frank L. Dolan, Freeman, Mo.
John P. Ekstrand, Bridgeport, Kansas.
James J. Erwin, Haselton, O.
Alexander W. Fenner, Providence, R. I.
Henry J. Fischer, Cleveland, O.
Horatio N. Fraser, New York, N. Y.
Seymour F. Frizelle, Detroit, Mich.
William M. Giles, New York, N. Y.
Benjamin Green, Portsmouth, N. H.
Gottlieb M. Grosse, Cleveland, O.
Arthur Edward Hanson, Philadelphia, Pa.
Archibald K. Henderson, Pittsburgh, Pa.
Frederick F. Hermann, San José, Costa Rica.
Bert Willis Hodgkins, Keene, N. H.
Alvin E. Holt, Detroit, Mich.
Albert E. Hughes, New York, N. Y.
Parker P. Ink, Washington, Ia.
Frank Lowber James, St. Louis, Mo.
Wm. Johnston, Jr., Detroit, Mich.
Thomas R. Keene, New Orleans, La.
Fred. P. Keller, Galveston, Tex.
Edward Kemp, New York, N. Y.
Ewen Chisholm Kennedy, Jersey City, N. J.
William Charles Kirchgasser, Chicago, Ill.
John Kochan, Denver, Col.
Henry Kuhlmeier, Cleveland, O.
Seraphin Lachance, Montreal, Can.
Alfred A. Laing, Cambridgeport, Mass.
Louis C. A. Last, Moberly, Mo.
Theodore C. Loehr, Carlinville, Ill.
Elmer J. McElwee, Mount Pleasant, Pa.
Geo. Clinton McKesson, New York, N. Y.
Paul E. Meissner, Milwaukee, Wis.
Gerhard Mennen, Newark, N. J.
Charles G. Merrell, Cincinnati, O.
John T. Moore, Lawrence, Kansas.

Joseph E. Morrison, Quebec, Quebec.
Chas. Milan Morse, Nashua, N. H.
Rosa Belle Mosher, Buffalo, N. Y.
Edward B. Norton, Mobile, Ala.
James O'Hare, Providence, R. I.
William A. Padley, Muskegon, Mich.
John Dabney Palmer, Monticello, Fla.
Edwin Freeman Phillips, Armada, Mich.
Joseph Price, Salem, Mass.
Edward A. Robinson, Lowell, Mass.
Julius O. Schlotterbeck, Ann Arbor, Mich.
Edward C. Soetje, Monticello, Ia.
Frank Sohn, St. Louis, Mo.
G. Henry Sohrbeck, Moline, Ill.
H. W. Spangler, Perry, Kansas.
Geo. Spitzer, Bluffton, Ind.
Henry A. Stearns, Detroit, Mich.
Fred. D. Stevens, Detroit, Mich.
M. L. Stone, Wamego, Kansas.
Chas. A. Strathman, El Paso, Ill.
Celia W. Taylor, Loomis, Mich.
Robert Thomas, Jr., Thomasville, Ga.
Frank A. Thompson, Detroit, Mich.
J. Walton Travis, Cohoes, N. Y.
Mosely F. Tucker, Mobile, Ala.
W. L. Vennard, New York, N. Y.
George Wm. Wagner, Detroit, Mich.
Herbert K. Watson, Wilmington, Del.
William Henry Wearn, Charlotte, N. C.
Fred'k E. Whitcomb, St. Louis, Mo.
Charles F. Williams, Thomaston, Conn.
George G. Williams, Boston, Mass.
Stephen D. Woolley, Asbury Park, N. J.
George B. Wray, Yonkers, N. Y.

LIST OF MEMBERS IN ATTENDANCE AT DETROIT, MICH.

Names of delegates are indicated by *; delegates not members *†.

* Alexander, M. W., St. Louis, Mo.
* Alfreds, H. J., Providence, R. I.
Allen, A. W., Detroit, Mich.
Allen, W. H., Detroit, Mich.
* Ault, Chas. H., St. Louis, Mo.
Baier, Chas. G., Detroit, Mich.
Bain, A. W., Cincinnati, O.
* Bassett, Arthur, Detroit, Mich.
Baur, Jacob, Terre Haute, Ind.
Bayley, A. R., Cambridgeport, Mass.
Bedford, P. W., New York.
Bocking, Edmund, Wheeling, W. Va.
Bodemann, W., Chicago, Ill.
*† Bogel, Wm., New Orleans, La.
Brown, H. J., Ann Arbor, Mich.
* Brown, R. J., Leavenworth, Kan.
Burkhardt, M. A., Dayton, O.
Butler, C. H., Oswego, N. Y.
* Butler, F. H., Lowell, Mass.
Caldwell, Jas. W., Detroit, Mich.
* Canning, Henry, Boston, Mass.
* Cates, W. E., Providence, R. I.
Colcord, J. W., Boston, Mass.
* Conrath, Adam, Milwaukee, Wis.
Cook, T. P., Philadelphia, Pa.
Coon, J. V. D., New York.
Cornell, E. A., Williamsport, Pa.
*† Corrigan, P. C., O'Neill, Neb.
* Culbreth, D. M. R., Baltimore, Md.
* Dadd, Jno. A., Milwaukee, Wis.
* D'Avignon, J. E., Windsor, Can.
* Day, Chas. W., Springfield, Ill.
* De Forest, Wm. P., Brooklyn, N. Y.
Deitz, Chas. J., New York.
Dewoody, Wm. L., Pine Bluff, Ark.
* Diehl, C. Lewis, Louisville, Ky.
* Dilly, Oscar C., Louisville, Ky.
* Dupont, Wm., Detroit, Mich.
Eberbach, Ottmar, Ann Arbor, Mich.
Ebert, A. E., Chicago, Ill.
* Eccles, R. G., Brooklyn, N. Y.
* Eger, Geo., Cincinnati, O.
Eliel, Leo, South Bend, Ind.
*† Esau, Fred., Milwaukee, Wis.
Feemster, J. H., Cincinnati, O.
* Fennel, C. T. P., Cincinnati, O.
Finlay, A. K., New Orleans, La.
* Fleischer, A. T., Chicago, Ill.
* Foerkson, R. C., Chicago, Ill.
Frizelle, L. F., Detroit, Mich.
Garrigues, S. S., Ann Arbor, Mich.
* Good, Jas. M., St. Louis, Mo.
Green, A. L., Lafayette, Ind.
* Greyer, Julius, Cincinnati, O.
Grosse, G. M., Cleveland, O.
Gundrum, Geo., Ionia, Mich.
Haber, Louis A., Cleveland, O.
* Haeusgen, H. O., Louisville, Ky.
* Hallberg, C. S., Chicago, Ill.
* Hall, Wm. A., Greenville, Mich.
* Hancock, F. W., New Berne, N. C.
* Haussamen, A. L., Grafton, Dak.
Hawkins, Henry, Detroit, Mich.
* Haynes, D. O., Detroit, Mich.
* Hechler, G. L., Cleveland, O.
* Heinitsh, C. A., Lancaster, Pa.
Hening, J. C., Stillwater, Minn.
Hermann, F. F., San Jose, Costa Rica.
*† Hinchman, T. H., Detroit, Mich.
Hodgkins, B. W., Keene, N. H.
Hoffmann, F., New York.
*† Hogan, L. C., Chicago, Ill.
Hollister, A. H., Madison, Wis.
Holt, A. E., Detroit, Mich.
* Holzhauer, Chas., Newark, N. J.
* Hopp, Lewis C., Cleveland, O.
* Hoskinson, J. T., Philadelphia.
Howson, A. B., Chillicothe, O.

*† Hull, W. J., Alexandria, Dak.
Hurty, J. N., Indianapolis, Ind.
Ingalls, John, Macon, Ga.
Inglis, Frank, Detroit, Mich.
Ink, P. P., Washington, Ia.
* Jamieson, T. N., Chicago, Ill.
James, F. L., St. Louis, Mo.
Jesson, Jacob, Muskegon, Mich.
Johnston, Wm., Jr., Detroit, Mich.
Jones, S. S., Wilkesbarre, Pa.
Judge, J. F., Cincinnati, O.
Kennedy, E. J., Detroit, Mich.
Kennedy, G. W., Pottsville, Pa.
Kephart, Henry, Berrien Springs, Mich.
Keppler, C. L., New Orleans, La.
* Kienth, H., Milwaukee, Wis.
Kirchgasser. W. C., Chicago, Ill.
Krehe, J. T., Muscatine, Ia.
* Labold, J. M., Devil's Lake, Dak.
* Lachance, S., Montreal, Can.
* Lemberger, J. L., Lebanon, Pa.
Lloyd, J. U., Cincinnati, O.
Lyman, A. H., Manistee, Mich.
Macmahan, T. J., New York.
Maisch, J. M., Philadelphia.
Marquardt, J. F., Tiffin, O.
* Masi, F. H., Norfolk, Va.
Maynard, H. S., Chicago, Ill.
McDonald, Geo., Kalamazoo, Mich.
McElwee, E. J., Mount Pleasant, Pa.
*† McFarland, A., Detroit, Mich.
McIntyre, B. F., New York.
* McNeil, J. M., Scottdale, Pa.
Meissner, P. E., Milwaukee, Wis.
Merrell, Geo., Cincinnati, O.
Meyer, C. F. G., St. Louis, Mo.
*† Meyers, J. A., Columbia, Pa .
Morgan, C. R., Philadelphia.
* Mueller, O. E., Louisville, Ky.
*† Muir, E., Montreal, Can.
Munds, J. T., New York.
* Nichols, T. B., Salem, Mass.
Oldberg, Oscar, Chicago, Ill.
* Painter, Emlen, New York.
Parkill, Stanley E., Owosso, Mich.
*† Patterson, B. M., Detroit, Mich.
Patterson, T. H., Chicago, Ill.
* Patton, J. F., York, Pa.
* Perry, F. W. R., Detroit, Mich.
Peyton, R. D., Louisville, Ky.
* Pfingst, Ed. C., Louisville, Ky.
Prall, D. E., East Saginaw, Mich.
* Prescott, A. B., Ann Arbor, Mich.
* Puchner, W. A., Chicago, Ill.
Quackinbush, B. F., New York.
* Remington, Jos. P., Philadelphia.
* Rendigs, C. P., Cincinnati, O.
* Robertson, A. C., Pittsburg, Pa.
* Rogers, W. H., Middletown. N. Y.
* Rohlfing, C. H. T., St. Louis, Mo.
Ross, David W., Philadelphia, Pa.
Ruppert, John, Cincinnati, O.
* Rudolf, Mrs. E., New Orleans, La.
Sander, Enno, St. Louis, Mo.
* Sawyer, W. F., Boston, Mass.
* Sayre, L. E., Lawrence, Kan.
Schaaf, J. H., Gallipolis, O.
Schellentraeger, E. A., Cleveland, O.
* Schmidt, F. M., Chicago, Ill.
* Seabury, G. J., New York.
* Sheppard, S. A. D., Boston, Mass.
* Simmon, Karl, St. Paul, Minn.
Sloan, Geo. W., Indianapolis, Ind.
*† Smith, A. D., Manchester, N. H.
* Smith, Henry, Decatur, Ill.
Snow, H. W., Detroit, Mich.
Soetje, Ed., Monticello, Ia.
* Spofford, C. B., Claremont, N. H.
Stearns, H. F., Detroit, Mich.
Stein, Jacob H., Reading, Pa.
* Stevens, A. B., Ann Arbor, Mich.
Stevens, Fred. D., Detroit, Mich.
* Stevens, S. H., Pittsburg, Pa.
Stewart, F. E., Wilmington, Del.
Stone, C. G., Detroit, Mich.
Strathman, C. A., El Paso, Ill.
* Stryker, C. W., Philadelphia.
Taylor, Celia W., Loomis, Mich,
Thompson, F. A., Detroit, Mich.
Thompson, F. B., Detroit, Mich.
* Thompson, J. L., Nashville, Tenn.
Thurston, Azor, Grand Rapids, O.
Todd, A. M., Nottowa, Mich.
* Trimble, H., Philadelphia.
* Uhlich, F. G., St. Louis, Mo.
* Upson, Rosa, Marshalltown, Ia.
Vernor, James, Detroit, Mich.
Voss, Geo. W., Cleveland, O.
Wagner, G. W., Detroit, Mich.
Wangler, C. D., Waterloo, Ia.
* Webber, J. L., Detroit, Mich.
Weinman, O. C., New York.

* Wetterstroem, Albert, Cincinnati, O.
Weyer, John, Cincinnati, O.
* Whelpley, H. M., St. Louis, Mo.
* Wilcox, Fred., Waterbury, Ct.
*† Williams, H. C., Detroit, Mich.
Wolfe, N., Philadelphia, Pa.
Woltersdorf, L. Chicago, Ill.
* Yeager, A. A., Knoxville, Tenn.

ENTERTAINMENTS.

A large number of pharmacists came to Detroit during the first week of September to attend the meetings of the National and of the State Associations, the former holding its sessions in the armory of the Detroit Light Infantry, while the State Association convened in the Light Guard Armory. The influx of visitors being too great to find accommodations in one hotel, the members were necessarily somewhat scattered; but a sufficient number had put up at each of the eight or ten hotels to make the stay pleasant and enjoyable in each case. While the Council and some of the committees held their sessions at the Cadillac, the parlors at the Light Infantry Armory were the headquarters of the ladies, and a Committee of Detroit ladies was constantly in attendance to receive visitors and to contribute to their pleasure.

The badge provided by the Committee on Arrangements was a miniature pill-tile made of celluloid, the different organizations being distinguished by different colored ribbons pinned to the badge.

On Monday and Tuesday, during the intervals between the sessions, many members paid visits to some of the manufacturing establishments, of which Detroit has a large number, or crossed the Detroit river, to take a look at Windsor, Ontario. The beautiful streets and avenues, the handsome stores, the very interesting exhibits in the Rink on Larned street, contiguous to the meeting room, attracted at all times the attention of the members and their ladies.

On Wednesday forenoon a carriage drive was provided for the ladies, who were taken in charge by the local committee to point out the numerous buildings and places of interest. In the evening the officers of the two Associations held a reception in the Light Infantry Armory, which was followed by a dance, lasting until after midnight.

Thursday forenoon the ladies made an excursion to Island Park, on Belle Isle, a beautiful city park located in the upper part of the Detroit River. The evening was devoted to witnessing the Conried–Hermann Opera Company at White's Grand Opera House in "The Gypsy Baron."

After adjournment on Friday morning the party embarked on the steamer Greyhound, and starting from the foot of Griswold street passed along the city's water front, landing near the laboratory of Messrs. Parke, Davis & Co. The entire establishment was thrown open, and the party was escorted in small sections through all the rooms, thus affording an opportunity of viewing the various operations carried on there by about

700 employes. A large tent had been put up in the yard, and seats provided for the visitors to partake of a bounteous supply of refreshments. Returning to the steamer the trip was continued across Lake St. Clair, through the St. Clair Flats Ship Canal, a distance of 65 miles. The light rain setting in did not interfere with the enjoyment of the party that had embarked on the commodious steamer, and when the Star Island House, on the St. Clair Flats, was reached, all did ample justice to the elegant dinner provided for the occasion. Before the toasting and speech making had been finished, the signal was given for the return trip, and the speeches had to be continued on the homeward run. The wharf was reached about 8 p. m., and after bidding adieu the company dispersed, partly for the journey toward home, partly for extending the vacation by visits to Ann Arbor, or by excursions via Lakes Huron and Michigan to Chicago.

The Committee on Arrangements well deserved the praise bestowed upon them, and more particularly their chairman, Mr. James Vernor, the local secretary, who had his office at the entrance to the Exhibition Building, and was untiring in his efforts to make the stay of every visitor as pleasant and profitable as possible.

LIST OF COLLEGES AND ASSOCIATIONS.

HAVING ACCREDITED DELEGATES TO THE THIRTY-SIXTH ANNUAL MEETING, WITH THE ADDRESSES OF THEIR PRESIDENTS AND SECRETARIES.

COLLEGES OF PHARMACY.

Colleges.	*Presidents.*	*Secretaries.*
Chicago	George Buck	W. A. Puchner.
Cincinnati	F. A. Kautz	Chas. T. P. Fennel.
Louisville	J. W. Fowler	Fred. C. Miller.
Maryland (Baltimore)	E. Eareckson	John W. Geiger.
Massachusetts (Boston)	Henry Canning	Chas. C. Williams.
National (Washington)	H. E. Kalusowski	R. L. Eliot.
New York	Ewen McIntyre	J. N. Hegeman.
Ontario		I. T. Lewis.
Philadelphia	Chas. Bullock	Wm. B. Thompson
Pittsburgh	Geo. A. Kelly	Will S. Jones.
St. Louis	F. W. Sennewald	G. H. C. Klie.

STATE PHARMACEUTICAL ASSOCIATIONS.

	Presidents.	*Secretaries.*
Alabama		P. C. Candidus, Mobile.
Arkansas	W. W. Kerr, Batesville	J. W. Beidelman, Little Rock.
Connecticut	H. H. Daboll, New London.	Frederic Wilcox, Waterbury.
Dakota (North)	C. N. Valentine, La Moure.	H. L. Haussamen, Grafton.
Dakota (South)	W. S. Branch, Parker.	I. A. Keith, Lake Preston.
Delaware	H. R. Bringhurst, Wilmington	J. M. Harvey, Wilmington.
Georgia	Wm. S. Parker, Atlanta	H. R. Slack, Jr., LaGrange.
Illinois	Henry Smith, Decatur	L. C. Hogan, Englewood.
Indiana	Arthur L. Green, Lafayette	J. R. Perry, Indianapolis.
Iowa	R. W. Crawford, Ft. Dodge	Rosa Upson, Marshalltown.
Kansas	W. W. Naylor, Holton	John T. Moore, Lawrence.
Kentucky	W. L. Johnson, Henderson	W. B. McRoberts, Stanford.
Louisiana	C. L. Keppler, New Orleans	L. F. Chalin, New Orleans.
Massachusetts	B. F. Stacey, Charlestown.	J. W. Colcord, Boston.
Michigan	A. Bassett, Detroit	S. E. Parkill, Owosso.
Minnesota	J. C. Hening, Stillwater.	K. Simmon, St. Paul.
Missouri	J. M. Good, St. Louis.	G. H. C. Klie, St. Louis.
Nebraska	W. B. Shryock, Louisville.	Chas. J. Daubach, Lincoln.
New Hampshire	N. S. Whitman, Nashua.	C. B. Spofford, Claremont.
New Jersey	G. H. White, Jersey City	F. B. Kilmer, New Brunswick.

	Presidents.	*Secretaries.*
New York	R. G. Eccles, Brooklyn	Clay W. Holmes, Elmira.
North Carolina	T. D. Crawford, Oxford.	E. V. Zoeller, Tarboro.
Ohio	M. D. Fulton, Bucyrus	Lewis C. Hopp, Cleveland.
Pennsylvania	Wm. Harris, Hamburg	J. A. Miller, Harrisburg.
Rhode Island		Wm. E. Cates, Providence.
Tennessee	R. A. Sloan, Chattanooga	J. L. Thompson, Nashville.
Virginia	E. A. Craighill, Lynchburg	C. B. Fleet, Lynchburg,
Wisconsin	J. C. Huber, Fond-du-Lac	E. B. Heimstreet, Janesville.
Province of Quebec	J. Contant, Montreal	E. Muir, Montreal.

LOCAL ASSOCIATIONS.

	Presidents.	*Secretaries.*
Cleveland O.	E. B. Lane	Wm. Bodebender.
Dauphin Co., Pa.	J. W. Hay, Harrisburg	J. A. Miller, Harrisburg.
Detroit, Mich.	J. W. Caldwell	B. W. Patterson.
Kings Co., N. Y.	L. F. Stevens, Brooklyn	F. N. Bliss, Brooklyn.
St. Louis Microscopists.	H. M. Whelpley	F. Davis, Belleville, Ill.

ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

	Presidents.	*Secretaries.*
Chicago	W. A. Puchner.	A. E. Venn.
Cincinnati	Ed. Mühlberg	E. H. W. Stahlhuth.
Louisville	Oscar C. Dilly	E. R. Constantine.
Philadelphia	C. B. Lowe	Wm. E. Krewson.
St. Louis	T. A. Buckland	H. M. Whelpley.

LIST OF PUBLICATIONS RECEIVED

FOR THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Societies and editors are respectfully requested to forward all publications intended for the American Pharmaceutical Association to the Permanent Secretary. European exchanges, if not sent by mail, will reach us through the Smithsonian Institution at Washington.

JOHN M. MAISCH,
143 North Tenth Street, Philadelphia.

☞ Proceedings of State Pharmaceutical Associations should be sent to the REPORTER ON THE PROGRESS OF PHARMACY, C. LEWIS DIEHL, Louisville, Ky.

Second Annual Report of the State Board of Health of the State of Maine, for 1886.
American Druggist, New York, 1888.
American Pharmacist, Detroit, 1888.
Deutsch-Amerikanische Apotheker Zeitung, New York, 1888.
Pharmaceutical Record, 1888.
Pharmaceutische Rundschau, 1888.
The Druggists' Circular, 1888.
Annual Report of the State Librarian of New Jersey, 1887.
American Journal of Medical Sciences, Philadelphia, 1888.
American Journal of Pharmacy, Philadelphia, 1888.
Transactions of the College of Physicians, 3d Series, IX.
The Western Druggist, Chicago, 1888.
The National Druggist, St. Louis, 1888.
Transactions of the Academy of Science of St. Louis, Vol. v., No. 1, 2.
The Canadian Pharmaceutical Journal, Toronto, 1888.
Pharmaceutical Journal and Transactions, London, 1888.
Yearbook of Pharmacy and Transactions of the British Pharmaceutical Conference, 1887.
Calendar of the Pharmaceutical Society of Great Britain, 1888.
The Chemist and Druggist, London, 1888.
The Chemists' and Druggists' Diary, 1888.
Calendar of the Pharmaceutical Society of Ireland, 1888.
Proceedings of the Philosophical Society of Glasgow, 1886-87, vol. xviii.
Zeitschrift des Allgemeinen Oesterreichischen Apotheker-Vereines. Wien, 1888.
Anzeiger der K. K. Akademie der Wissenschaften. Wien, 1888.
Nachrichten von der K. Gesellschaft der Wissenschaften zu Göttingen, 1887.
Proceedings of the American Academy of Arts and Sciences, New Series, XV., 1.
Transactions of the Medical and Chirurgical Faculty of the State of Maryland, 1888.

LIST OF SOCIETIES, LIBRARIES, JOURNALS, AND INDIVIDUALS,

TO WHOM COMPLIMENTARY COPIES OF THE PROCEEDINGS OF THIS ASSOCIATION ARE FORWARDED.

The State Libraries of all the States of the Union except Connecticut. (At the request of the State Librarian of Connecticut, a copy of the Proceedings is sent to Trinity College, Hartford, Conn.)

Alabama.—Alabama Pharmaceutical Association, P. C. Candidus, Secretary, Mobile.

Arkansas.—Arkansas Association of Pharmacists, J. W. Beidelman, Secretary, Little Rock.

California.—California College of Pharmacy, San Francisco.

Colorado.—

Connecticut.—Connecticut Pharmaceutical Association, F. Wilcox, Secretary, Waterbury.
" Medical Journal and Library Association, Hartford.
" Trinity College, Hartford.
" Silas Bronson Library, Waterbury.
" Yale College, New Haven.

Dakota.—North Dakota Pharmaceutical Association, H. L. Haussamen, Secretary, Grafton.
" South Dakota Pharmaceutical Association, I. A. Keith, Secretary, Lake Preston.

Delaware.—Delaware Pharmaceutical Association, J. M. Harvey, Secretary, Wilmington.

District of Columbia.—National College of Pharmacy, Washington.
" Bureau of Education, Washington.
" Congressional Library, Washington.
" Department of Agriculture, Washington.
" Library of the American Medical Association, Washington.
" Smithsonian Institution, Washington.
" Surgeon General, United States Army, Washington.
" Surgeon-General, United States Marine Hospital Service, Washington.
" Surgeon-General United States Navy, Washington.
" United States Patent Office, Washington.

Florida.—Florida State Pharmaceutical Association, J. A. Conover, Secretary, Jacksonville.

Georgia.—Georgia Pharmaceutical Association, H. R. Slack, Jr., Secretary, La Grange.

Illinois.—Illinois Pharmaceutical Association, L. C. Hogan, Secretary, Englewood.
" Chicago College of Pharmacy, Chicago.
" The Western Druggist, Chicago.

Indiana.—Indiana Pharmaceutical Association, J. R. Perry, Secretary, Indianapolis.
" Purdue University, Lafayette.

Iowa.—Iowa State Pharmaceutical Association, Rosa Upson, Secretary, Marshalltown.
Kansas.—Kansas Pharmaceutical Association, J. T. Moore, Secretary, Lawrence.
" Kansas State University, Lawrence.
Kentucky.—Kentucky Pharmaceutical Association, W. B. McRoberts, Secretary, Stanford.
Louisville College of Pharmacy, Louisville.
Louisiana.—Louisiana State Pharmaceutical Association, L. F. Chalin, Secretary, New Orleans.
Maine.—Maine Insane Asylum, Augusta.
" Bowdoin College, Brunswick.
Maryland.—Maryland Pharmaceutical Association, M. L. Byers, Secretary, Hagerstown.
" Maryland College of Pharmacy, Baltimore.
" Maryland Academy of Sciences, Baltimore.
" Medical and Chirurgical Faculty of Maryland, Dr. G. L. Taneyhill, Secretary, Baltimore.
" University of Maryland, Baltimore.
Massachusetts.—Massachusetts State Pharmaceutical Association, J. W. Colcord, Secretary, Lynn.
" Amherst College, Amherst.
" American Academy of Arts and Sciences, Boston.
" Boston Athenæum, Boston.
" City Library, Boston.
" City Hospital, Boston.
" Harvard University, Cambridge.
" Massachusetts College of Pharmacy, Boston.
" Massachusetts General Hospital, Boston.
" Medical Library Association, Boston.
Michigan.—Michigan State Pharmaceutical Association, S. E. Parkill, Secretary, Owosso.
" American Pharmacist, Detroit.
" The Pharmaceutical Era, Detroit.
" University of Michigan, Ann Arbor.
Minnesota.—Minnesota State Pharmaceutical Association, K. Simmon, Secretary, St. Paul.
Mississippi.—Mississippi State Pharmaceutical Association, H. F. West, Secretary, Fayette.
Missouri.—Missouri State Pharmaceutical Association, G. H. C. Klie, Secretary, St. Louis.
" Academy of Science of St. Louis, St. Louis.
" National Druggist, St. Louis.
" The Druggist, St. Louis.
" St. Louis College of Pharmacy, St. Louis.
" St. Louis Mercantile Library, St. Louis.
" St. Louis Public School Library, St. Louis.
Nebraska.—Nebraska State Pharmaceutical Association, C. J. Daubach. Secretary, Lincoln.
Nevada.—
New Hampshire.—New Hampshire Pharmaceutical Association, C. B. Spofford, Secretary, Claremont.
" Dartmouth College, Hanover.
New Jersey.—New Jersey Pharmaceutical Association, F. B. Kilmer, Secretary, New Brunswick.
" New Jersey State Lunatic Asylum, Trenton.

New York.—New York State Pharmaceutical Association, C. W. Holmes, Secretary, Elmira.
" Albany College of Pharmacy, Albany.
" American Druggist, New York.
" Astor Library, New York.
" College of Pharmacy of the City of New York, New York.
" Deutsch-Amerikanische Apotheker Zeitung, New York.
" Druggists' Circular, New York.
" Literary and Scientific Society of German Apothecaries, New York.
" Mercantile Library, New York.
" New York Academy of Medicine, 12 West 31st Street, New York.
" Oil, Paint, and Drug Reporter, New York.
" Pharmaceutical Record, New York.
" Pharmaceutische Rundschau, New York.
" Long Island Historical Society, Brooklyn.

North Carolina.—North Carolina Pharmaceutical Association, E. V. Zoeller, Secretary, Tarboro.

Ohio.—Ohio State Pharmaceutical Association, L. C. Hopp, Secretary, Cleveland.
" Cincinnati Academy of Medicine, Cincinnati.
" Cincinnati College of Pharmacy, Cincinnati.
" Mussey Medical Library, Cincinnati.
" Longview Asylum, Carthage, Hamilton county.

Oregon.—

Pennsylvania.—Pennsylvania Pharmaceutical Association, J. A. Miller, Secretary, Harrisburg.
" Academy of Natural Sciences, Philadelphia.
" American Journal of Medical Sciences, Philadelphia.
" American Journal of Pharmacy, Philadelphia.
" American Philosophical Society, Philadelphia.
" College of Physicians, Philadelphia.
" Franklin Institute, Philadelphia
" Mercantile Library, Philadelphia.
" Pennsylvania Hospital, Philadelphia.
" Philadelphia College of Pharmacy, Philadelphia.
" Philadelphia Library, Philadelphia.
" Pittsburgh College of Pharmacy, Pittsburgh.

Rhode Island.—Rhode Island Pharmaceutical Association, W. E. Cates, Secretary, Providence.

South Carolina.—South Carolina Pharmaceutical Association, ——— Secretary.
" South Carolina Medical Association, Dr. J. L. Dawson, Secretary, Charleston.

Tennessee.—Tennessee Druggists' Association, J. L. Thompson, Secretary, Nashville.

Texas.—Texas State Pharmaceutical Association, E. D. Oesch, Secretary, Fort Worth.

Vermont.—University of Vermont, Burlington.

Virginia.—Virginia Pharmaceutical Association, C. B. Fleet, Secretary, Lynchburg.

West Virginia.—West Virginia Pharmaceutical Association, C. Menkemeller, Secretary, Wheeling.

Wisconsin.—Wisconsin Pharmaceutical Association, E. B. Heimstreet, Secretary, Janesville.
" University of Wisconsin, Madison.

Canada.—Halifax Pharmaceutical Society, Halifax, Nova Scotia.
" Ontario College of Pharmacy, Toronto.
" Pharmaceutical Association of the Province of Quebec, E. Muir, Secretary, Montreal.
Mexico.—Escuela de Farmacia, Mexico.
Argentine Republic.—Sociedad de Farmacia Argentina, Buenos Ayres.
Austria.—Zeitschrift d. Allg. Oesterreichischen Apotheker-Vereines, Wien.
" K. K. Gesellschaft der Aerzte, Wien.
" K. Akademie der Wissenschaften, Wien.
Belgium.—Académie Royale de Médecine de Belgique, Bruxelles.
" Société de Pharmacie Royale de Bruxelles.
" Société Royale des Sciences Médicales et Naturelles, Bruxelles.
" Société de Pharmacie d'Anvers.
Denmark.—Archiv for Pharmacie, S. M. Trier, Kjobenhavn.
" Denmark's Apotheker Forening, Gust. Lodze, President, Odense.
France.—Bibliothèque de l' École supérieure de Pharmacie, Paris.
Germany.—Archiv der Pharmacie, Waisenhausbuchhandlung, Halle.
" K. Akademie der Wissenschaften, Göttingen.
" K. Bayer. Akademie der Wissenschaften, München.
" K. Bibliothek der Universität Strassburg.
" Pharmaceutisches Institut, Universität Erlangen.
Great Britain.—British Pharmaceutical Conference, 17 Bloomsbury Square, London.
" Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London.
" Pharmaceutical Journal and Transactions, 17 Bloomsbury Square, London.
" Chemical News, Boy Court, Ludgate Hill, London, E. C.
" Chemist and Druggist, 44 Cannon Street, London.
" British Museum, London.
" Association of Chemists and Druggists, Wolverhampton.
" Coventry and Warwickshire Pharmaceutical Association, Coventry.
" Liverpool Chemists' Association.
" Pharmaceutical Society at Edinburgh, 36 York Place.
" Pharmaceutical Society of Ireland, Dublin.
" Philosophical Society, Glasgow.
Italy.—R. Biblioteca Nazionale, Firenze.
" Archivio di Farmazia, Roma.
Netherlands.—Nederlandsche Maatschappij ter bevordering der Pharmacie, Jacobus Polak, Secretary, Amsterdam.
Norway.—Kongelige Norske Universitet i Christiani.
Russia.—Pharmaceutische Gesellschaft in St. Petersburg, St. Petersburg.
" Pharmaceutisches Institut, Dorpat, Russia.
Sweden.—Pharmaceutical Institution, Stockholm, Sweden.
Switzerland.—Schweizerische Wochenschrift für Pharmacie, A. Klunge, Aubonne.
Australia.—Pharmaceutical Society of Victoria, Melbourne.
" Australasian Journal of Pharmacy, Melbourne.
" Pharmaceutical Society of New South Wales, Sydney.
" Pharmaceutical Society of New Zealand, Auckland.

GENERAL INCORPORATION LAW FOR THE DISTRICT OF COLUMBIA.

SECTIONS APPLICABLE TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

CLASS 3, SOCIETIES, BENEVOLENT, EDUCATIONAL, ETC.

SEC. 545. Any three, or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts, may make, sign, and acknowledge before any officer authorized to take acknowledgment of deeds in the District, and file in the office of the Recorder of Deeds, to be recorded by him, a certificate in writing, in which shall be stated:

First. The name or title by which such society shall be known in law.

Second. The term for which it is organized, not exceeding twenty years.

Third. The particular business and objects of the society.

Fourth. The number of its trustees, directors, or managers for the first year of its existence.

SEC. 546. Upon filing their certificate, the persons who shall have signed and acknowledged the same, and their associates and successors, shall be a body politic and corporate, by the name stated in such certificate; and by that name they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents; and may take, receive, hold and convey real and personal estate necessary for the purposes of the society as stated in their certificate.

SEC. 547. Such incorporated society may annually, or oftener, elect from its members its trustees, directors, or managers, at such time and place and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business, and whenever any vacancy shall happen among such trustees, directors, or managers, the vacancy shall be filled in such manner as shall be provided by the by-laws of the society.

SEC. 548. The trustees, directors, or stockholders of any existing benevolent, charitable, educational, musical, literary, scientific, religious, or missionary corporation, including societies formed for mutual improvement, may, by conforming to the requirements herein, re-incorporate themselves, or continue their existing corporate powers under this chapter, or may change their name, stating in their certificate the original name of such corporation as well as their new name assumed; and all the property and effects of such existing corporation shall vest in and belong to the corporation so re-incorporated or continued.

SEC. 549. Such corporations may sell and dispose of any real estate they may acquire by purchase, gift, or devise, as follows; whenever any lot purchased for the use of the corporation, or any building erected thereon shall become ineligible for the uses for which the lot was purchased or the building erected, to be determined by a vote of two-thirds of the shares of the stock of the corporation or the members of the corporation, at a meeting of the stockholders, or corporators, or members specially called for that purpose, the proceedings of which meeting shall be duly entered in the records of the corporation, said lot or building may be sold, and the proceeds thereof may be vested in another lot, or in the erection another building, or both.

SEC. 550. When any real estate shall have been devised or given to any such corporation for any specified benevolent purpose, and where, by a vote of three-fourths of the stock held by the stockholders, or three fourths of the corporators, if no shares of stock have been created, at a meeting called for the purpose, of which such stockholders or corporators or members shall have at least ten days' notice, the corporation shall determine to surrender their corporate powers and cease to act under the same, said real and personal estate so acquired shall be sold at public auction, proper notice of the time and place of sale having been given, and the proceeds of the sale equitably distributed among the stockholders or corporators, or disposed of for the promotion and advancement of the objects for which such corporation was originally organized.

SEC. 551. No corporation acting under the six preceding sections shall hold real estate more than five years, except so much as shall be necessary for the purposes named in its certificate.

SEC. 552. The provisions of this chapter shall not extend or apply to any association or individual who shall, in the certificate filed with the recorder of deeds, use or specify a name or style the same as that of any previously existing incorporated body in the District.

Approved 5 May, 1870, c. 80, v. 16, pp. 98–116—Revised Statutes of the United States relating to the District of Columbia.

CERTIFICATE OF INCORPORATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Whereas, we, the undersigned, desire to form an association having for its object to unite the educated and reputable Pharmacists and Druggists of America, as will more fully hereinafter appear;

Now, therefore, we do hereby certify as follows:

First, The corporate name of the association is the American Pharmaceutical Association.

Second, This association shall continue until dissolved by the action of its members, or by the operation of law.

Third, The objects and business of said association are as follows:

a. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

b. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

c. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and in encouraging home production and manufacture in the several departments of the drug business.

d. To regulate the system of apprenticeship and employment, so as to prevent, so far as possible, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

e. To suppress empiricism and to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

f. To uphold standards of authority in the education, theory and practice of Pharmacy.

g. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and the greatest protection to the public.

Fourth. The concerns and affairs of the association shall be managed by a Council, which shall consist for the first year of John U. Lloyd, Maurice W. Alexander, Alexander K. Finlay, Karl Simmon, Samuel A. D. Sheppard, John M. Maisch, James Vernor, C. Lewis Diehl, William H. Rogers, William Saunders, Albert E. Ebert, Philip C. Candidus, George W. Kennedy, Albert H. Hollister, James M. Good, Lewis C. Hopp and William Dupont.

Given under our respective hands and seals this 12th day of December, A. D. 1887.

Signed : John U. Lloyd, Maurice W. Alexander,
Alex. K. Finlay, Karl Simmon,
Samuel A. D. Sheppard, John M. Maisch,
James Vernor, C. Lewis Diehl,
William H. Rogers, Wm. Saunders,
Albert E. Ebert, Philip C. Candidus,
Geo. W. Kennedy, Albert H. Hollister,
James M. Good, Lewis C. Hopp,
William Dupont,

Members of the Council,
And John A. Milburn, G. G. C. Simms,
E. B. Bury, Z. W. Cromwell,
W. S. Thompson, John R. Major,
Charles Christiani, W. G. Duckett,
A. J. Schafhirt, Geo. W. Boyd,
O. H. Coumbe, Henry A. Johnston,
Geo. B. Lockhart, W. C. Milburn,
T. C. Murray, Arthur Nattans,
Joseph R. Walton, Thomas M. Wehrly,

of the District of Columbia.

Notaries' certificates attached to the original document attest the genuineness of each and every signature.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulteration.

2. To encourage proper relations between Druggists, Pharmaceutists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a Permanent Secretary, a Local Secratary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom, with the exception of the Permanent Secretary, shall be elected annually, and shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice Presidents.

ARTICLE I. The President shall preside at all meetings of the Association, except those of the special Sections, as hereinafter provided. In his absence or inability, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. In meetings, the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports, and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all ballotings, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal, and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality or impropriety, he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in cases where he prefers to submit the matter to the meeting; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, unless provided for in the By-Laws, or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the Permanent Secretary.

Article I. The Permanent Secretary shall be elected to hold office permanently during the pleasure of the Association. He shall receive from the Treasurer an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

Article II. He shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve, on file, all reports, essays, and papers of every description received by the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Proceedings of the Association, under the direction of the Council.

Article III He shall read all papers handed him by the President for that purpose; shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act; and shall notify every member of the time and place of each annual meeting.

CHAPTER III.

Of the Local Secretary.

Article I. The Local Secretary shall be elected annually, near the close of the annual meeting, and shall reside at or near the place where the next annual meeting of the Association is to be held.

Article II. He shall assist the Permanent Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

Article III. An exhibition of objects interesting to pharmacists shall be held each year, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER IV.

Of the Treasurer.

Article I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

Article II. He shall pay no money except on the order of the Secretary, countersigned by the President, and accompanied by the proper vouchers.

Article III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual contributions for three years.

Article IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary of $600, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $10,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or Trust Company acceptable to the Council.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual sum of $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the Permanent Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the Permanent Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry, and Materia Medica, and the collateral branches of knowledge; on the changes in conditions of Pharmaceutical Institutions; together with such statistical, biographical, and obituary notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the Permanent Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which shall be empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by a special vote of the Council, be invited to speak on any subject under discussion.

ARTICLE II. The Council shall consist of seventeen members, nine of whom shall be elected by ballot by the Association, in the following manner: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. No elected member of the Council, after having served one term, shall be eligible for re-election to the Council to serve the next succeeding term.

ARTICLE III. The President, Vice-Presidents, Secretary, Local Secretary, Treasurer, and Reporter on the Progress of Pharmacy of the Association, shall be *ex officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice Chairman, and Secretary, to be elected by ballot annually by the Council. The Secretary may or may not be a member of the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association, from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association, without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears one copy of the annual publication of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sittings of the Association, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as they may deem worthy of insertion, and shall fix the price at which the Proceedings shall be sold.

CHAPTER VII.

Of Committees.

ARTICLE I. There shall be six standing committees; A Committee on Commercial Interests, and on the Revision of the U. S. Pharmacopœia, each to consist of five members; a Committee on Scientific Papers, a Committee on Prize Essays, a Committee on Legislation, and a Committee on Pharmaceutical Education, each to consist of three members.

ARTICLE II. The Committee on Commercial Interests shall be appointed by the Section on Commercial Interests. They shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. They shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association, they shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be appointed by the Section on Scientific Papers. They shall arrange the business of the Section, and shall report, near the close of each annual meeting, a proper number of questions of scientific and practical interest, the answers to which may advance the interest of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person writing a paper for the Association must, to insure its publication in the Proceedings, refer the same, with a synopsis of its contents, to the Committee on Scientific Papers previous to the first session.

ARTICLE V. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Scientific Papers before the first annual session of the Association.

ARTICLE VI. The Committee on Prize Essays, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, within six months after the annual meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the Committee, with such comments upon the successful essay only as they may deem proper, may be published in the Journals of Pharmacy.

ARTICLE VII. The Committee on Legislation, which shall be elected by the Section on Legislation, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on the subject has occurred during the year. They shall arrange the business of the Section in advance of its meetings, and propose suitable subjects for discussion.

ARTICLE VIII. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall be their duty to collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which officinal and non-officinal remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and feelings of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia.

ARTICLE IX. The Committee on Pharmaceutical Education shall be appointed by the Section on Pharmaceutical Education, and it shall be their duty to arrange the business of the Section in advance of its meetings, to propose suitable subjects for discussion, and to attend to such duties of the Section as may be delegated to them.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every Pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry, and Botany, who may be especially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

ARTICLE II. Any two members of the Association may propose to the Council the name of any person eligible to membership, and if approved, the Council shall recommend the person named to the Association, and if the Association shall by vote invite said person to become a member, his membership shall be completed by his signing the Constitution and By-Laws, and paying the annual contribution for the current year.

ARTICLE III. Every member shall pay in advance to the Treasury the sum of *Five Dollars* as his yearly contribution, and is liable to lose his membership by neglecting to pay said contribution for *three successive years.*

ARTICLE IV. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials should be sent to the Permanent Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, Permanent Secretary, and Treasurer.

ARTICLE VII. Persons constitutionally elected to membership become permanent members, and their membership can cease only by resignation, non-payment of dues, or by expulsion, as provided in these By-Laws.

ARTICLE VIII. Resignations of membership shall be made in writing to the Permanent Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council,

ARTICLE IX. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at some regular session.

ARTICLE X. Pharmacists, chemists, and other scientific men, who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office, or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, four Sections shall be formed, as follows: 1. Scientific Papers; 2. Commercial Interests; 3. Pharmaceutical Education; 4. Legislation.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read its minutes and act on the report of Council on membership.

ARTICLE V. At the third and fourth sessions the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. The fifth, sixth, and seventh sessions shall be devoted to the reading of scientific papers and the discussions thereof.

ARTICLE VII. The Sections on Legislation and Pharmaceutical Education shall hold their meetings at the eighth session, either at the same time or one after the other, as may be determined by the Association.

ARTICLE VIII. A Chairman and Secretary shall be elected by ballot by each Section to serve at the special meetings of said Section. And the minutes of each meeting, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the Permanent Secretary for publication or safe keeping.

ARTICLE IX. The Chairman of each Section shall preside at each of its meetings, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the next annual meeting.

ARTICLE X. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XI. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or in his absence one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. The Council shall read the names of the candidates for membership, as provided in Section 2, Article VIII., Chapter VI.

Section 6. Reports of Committees shall be presented, read by their titles, the synopsis or in full, and laid on the table for future consideration.

Section 7. The President shall call the roll of States represented, requesting each State in turn to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing year; in addition to which he shall appoint five members who are not delegates, to act with the Committee.

Section 8. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, their acts shall be revised, so as to be acceptable to the Association.

Section 9. Incidental business may be called up.

ARTICLE XII. The order of business at the second session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the officers nominated shall be balloted for.

Section 4. The Council shall present names recommended for membership.

Section 5. Reports of Standing Committees shall be read.

Section 6. Reports of Special Committees shall be read.

ARTICLE XIII. The order of business for the meetings of the Sections shall be determined by each Section for itself.

ARTICLE XIV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XV. At the last session of the Association the newly-elected officers of the Association shall take their respective places.

CHAPTER X.

Of Rules of Order and Debate.

Article I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

Article II. When a question is regularly before the meeting, and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

Article III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

Article IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

Article I. In all such points of order as are not noticed in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

Article II. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at any subsequent session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

Article III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The Officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices immediately after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of $50.

ARTICLE II. He shall post in a conspicuous place in the meeting room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose, shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting.

CHAPTER IV.

Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of five members of the Council, to be elected annually by ballot. The Permanent Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect their chairman immediately after their election by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present the list of applicants for membership, who have complied with the requirements of the By-Laws of the Association, to the Council.

ARTICLE III. They shall furnish appropriate obituary notices of deceased members for publication in the Proceedings.

ARTICLE IV. The Secretary of the committee shall receive an annual salary of $150.

CHAPTER V.

On Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, who shall elect their chairman immediately after their own election by the Council.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Proceedings.

CHAPTER VI.

On Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members. They shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the Permanent Secretary. They shall annually, at the meetings, and after due notice through the Pharmaceutical Journals, receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. After considering these applications, the Committee shall, at as early a date as possible, report to the Council, recommending such grants from the available funds as they may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

On Meetings.

ARTICLE I. The Council shall meet previous to the assembling of the Association and at such other times as they may adjourn to, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council. a special meeting shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and Secretary.
2. Election of the Standing Committees of Council, as follows:
   - *a.* Committee on Membership, consisting of five members of the Council, the Permanent Secretary, and Treasurer.
   - *b.* Committee on Finance, three members.
   - *c.* Committee on Publication, five members,
   - *d.* Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the meeting of the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or a negative vote, the Chairman of the Council, or the chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present.

ARTICLE III. Every proposition to alter or amend these By-Laws, shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the votes of three-fourths of the members present, it shall become a part of these By-Laws.

FORM OF PROPOSITIONS FOR MEMBERSHIP.

The undersigned members in good standing, being personally acquainted with the following persons eligible to membership in accordance with Chapter VIII. Article I. of the By-Laws, testify to their moral character, their skill as practical druggists and pharmacists, and their professional probity and good standing, and they recommend them for membership in the American Pharmaceutical Association.

NAMES.	ADDRESS.

FORM FOR COMPLETING MEMBERSHIP IN ACCORDANCE WITH CHAPTER VIII. ARTICLE II. OF THE BY-LAWS.

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them, and enclose the annual contribution, five dollars, for the current year.

Name in full, --

Date, --

Address, --

GENERAL RULES ON FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed, by the Council, an Examining Committee, this Committee to consist of three members residing in or near the same city or town, the chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Examining Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council shall forward to the Chairman of the Examining Committee, at the same time and place, the bonds, savings-bank books, and accounts of the same that may be in his hands.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, savings bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Examining Committee.

Tenth, There shall be a meeting of the Examining Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and, previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer given by a Trust Company shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna*, 1871.

BELGIUM.

A. T. DeMeyer, *Brussels*, 1868.

Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.
Dr. Robert Bentley, *London*, 1872.
Henry B. Brady, *Newcastle-on-Tyne*, 1871.
Michael Carteighe, *London*, 1882.
Thomas Greenish, *London*, 1882.
Joseph Ince, *London*, 1882.
Dr. J. Redwood, *London*, 1871.
Richard Reynolds, *Leeds*, 1882.
George W. Sandford, *London*, 1882.
Geo. F. Schacht, *Clifton*, *Bristol*, 1882.

FRANCE.

Dr. G. Planchon, *Paris*, 1877.
Dr. J. Léon Soubeiran, *Montpellier*, 1871.

GERMANY.

Dr. Christian Brunnengraeber, *Rostock*, 1882.
Dr. Adolph Duflos, *Annaberg*, 1871.
Dr. F. A. Flückiger, *Strassburg*, 1868.
Dr. Hermann Hager, *Pulvermühle bei Fürstenberg*, 1868.
Dr. Carl Schacht, *Berlin*, 1882.

NETHERLANDS.

Dr. J. E. De Vrij, *Hague*, 1871.

RUSSIA.

Dr. G. Dragendorff, *Dorpat*, 1868.
J. von Martenson, *St. Petersburg*, 1882.

SWITZERLAND.

Dr. Edward Schaer, *Zurich*, 1877.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPITALS. Names of Life Members under the old Constitution in *italics.*)

UNITED STATES OF AMERICA.

ALABAMA.

Birmingham.

Stollenwerck, Alphonse Leander	1887

Mobile.

Brown, Albert Edward	1887
Candidus, Philip Charles.	1857
Hawkins, Joseph Thomas	1878
Mohr, Charles	1871
Norton, Edward Benjamin	1888
Punch, William Francis	1874
Tucker, Mosely Fleming.	1888
Van Antwerp, Garet.	1880
Ward, Benjamin	1887

Montgomery.

Knabe, Gustavus Alexander	1876

Selma.

Galt, Edward Pegram	1883

ARKANSAS.

Batesville.

Goodwin, Eugene Richard	1887
Kerr, William Whitman	1887

Hot Springs.

Cabell, George William	1880
Menard, Robert Patterson	1883
Newman, Alcuin Eason	1880

Little Rock.

Bond, John Barnitz	1883
Bond, Sterling Price.	1887
Gibson, James Edwin	1887
Jungkind, John August.	1887

Pine Bluff.

Dewoody, William Lawrence.	1887

CALIFORNIA.

San Francisco.

Bacon, Gaston Ernest	1887
Beckett, Frederick Arthur	1885
Brackett, Aurick Smith	1868
Calvert, John	1870
Dawson, John Henry	1882
Devine, John.	1887
Joy, Edwin Wolcott.	1882
Lengfeld, Abraham Louis	1879
Moffit, Thomas Sabatier	1861
Runyon, Edward Wheelock	1875
Schmidt, Valentine	1887
Searby, William Martin	1882
Steele, Henry.	1859
Steele, James Gurden	1859
Wenzell, William Theodore	1870

Alameda, Alameda Co.

Elbe, Constantine Berthold.	1877

Eureka, Humboldt Bay.

Powell, Robert Baldwin	1880

Red Bluff.

Darrough, Charles Henry	1884

Vallejo, Solano Co.

Topley, James	1869

COLORADO.

Central City.

Best, John	1866

Denver.

Beitemann, William Wallace	1888
Chandler, Isaac Eugene	1888
Ford, Charles Mangan.	1887

Hartung, Hugo Rudolph 1876
Kochan, John 1888
Scholtz, Edmund Louis 1881
Steinhauer, Frederick 1881
Walbrach, Arthur. 1881

Salida.

Thurber, Allen Russell. 1880

Sopris.

Davison, John Thorne. 1888

COLUMBIA, DISTRICT OF.

Washington.

Boyd, George Washington 1883
Bury, Edward Berkley. 1870
Christiani, Charles 1874
Coumbe, Oscar Henry 1883
Cromwell, Zachariah William. . . . 1870
Duckett, Walter G. 1876
Dufour, Clarence Reuter. 1876
Johnston, Henry Angustus 1883
Lockhart, George Bradfield. . . . 1883
Major, John Richards 1873
Martin, John Charles 1883
Milburn, John Alexander 1858
Milburn, Washington Coad. 1883
Murray, Talbot Chambers 1883
Nattans, Arthur. 1883
Pettingill, Edward True 1880
Schafhirt, Adolph Julian 1876
Simms, Giles Green Craycroit. . . . 1860
Thompson, William Scott 1871
Walton, Joseph Richardson. 1883
Wehrly, Thomas McAleer 1883

CONNECTICUT.

Ansonia.

Bristol, Charles Edward 1880

Hartford.

Chapin, Frederick Hastings. 1880
Goodrich, Stephen 1875
Goodwin, Lester Henry 1875
Rapelye, Charles Andrew 1876
Williams, John Kirby 1875

Litchfield.

Gates, Howard Eugene 1873

Meriden.

Parker, John Herbert 1880

Middletown.

Pitt, John Richard, Jr. 1872

Naugatuck.

May, James Oscar, ... 1875

New Britain.

Thompson, Edward Willett. 1880

New Haven.

Benedict, Willis 1882
Fraucis, Walter Russell 1882
Gessner, Emil Adolph 1878
Spalding, Warren Alphonso 1876
Sperry, Herman Jay. 1880
Wells, Romanta 1877

New London.

Nichols, John Cutter 1886

Norwich.

Osgood, Hugh Henry 1875
Sevin, Nathan Douglas 1875

Putnam.

Dresser, George Edward. 1886

Stamford.

Haight, William Bogardus 1872

Thomaston.

Williams, Charles F. 1888

Thompsonville, Hartford Co.

Smith, Edward Newton 1885

Waterbury.

Dikeman, Nathan. 1859
Munson, Luzerne Ithiel 1872
Wilcox, Frederick 1878
Woodruff, Roderick Samuel 1876

West Winsted.

Phelps, Dwight. 1873

Willimantic.

Wilson, Frank Milton 1883

DAKOTA.

Devil's Lake.

Labold, Joseph M. 1888

Grafton.

Haussamen, Henry Louis 1888

Mitchell.

Warne, Henry Lee	1881

DELAWARE.

Wilmington.

Beetem, Jacob Samuel	1888
Belt, Zedekiah James	1876
Smith, Linton	1870
Stewart, Francis Edward	1884
Watson, Herbert Kennedy	1888

FLORIDA.

Apopka, Orange Co.

Kent, Robert Restieaux	1855

Cedar Key.

Wooldridge, Napoleon	1883

Fort George.

Rollins, John Francis	1859

Jacksonville.

Aird, William	1887
Hughes, George	1887
Watson, Sidney Powell	1887

Kissimmee.

Spears, Jacob Vurnon	1887

Monticello.

Palmer, John Dabney	1888

Pensacola.

Cushman, Henry Clay	1887

Waldo.

Wheeler, Lucien Fitch	1858

GEORGIA.

Albany.

Welch, Leonard Edward	1878

Atlanta.

Behre, Charles Henry Ernst	1882
Bradfield, Louis Henry	1878
Jacobs, Joseph	1882
Rankin, Jesse Willis	1877
Renouff, James Theron	1877
Schumann, Theodore	1860

Augusta.

Durban, Sebastian Charles	1883
Land, Robert Henry	1859

Macon.

Brunner, Norman Isaac	1878
Hunt, Leonard Washington	1878
Ingalls, John	1876
McConville, Thomas Aloysius	1864

Thomasville.

Bondurant, Charles Scott	1888
Thomas, Robert, Jr	1888

IDAHO TERRITORY.

Murray, Shoshone Co.

Ingalls, Albert Orfila	1885

ILLINOIS.

Altenheim, Cook Co.

McPherson, George	1865

Bradford, Stark Co.

Plummer, David Gorham	1869
Plummer, William Pitt	1881

Camp Point, Adams Co.

Bartells, George Case	1881

Carlinville, Macoupin Co.

Loehr, Theodore Christian	1888

Chicago.

Ade, Samuel Gottlob	1883
Bartlett, Nicholas Gray	1864
Behrens, Paul Johannes Heinrich	1888
BIROTH, HENRY	1865
Blocki, William Frederick	1863
Bodemann, Wilhelm	1887
Buck, George	1860
Button, Charles Edwin	1881
Conrad, John	1887
EBERT, ALBERT ETHELBERT	1864
Fleischer, Adolph Theodore	1888
Foerkson, Richard Christopher	1888
Fuller, Oliver Franklin	1869
Gale, Edwin Oscar	1857
Gale, William Henry	1857
Grassly, Charles William	1884
Guy, George Omar	1884
Hallberg, Carl Swante Nicanor	1879
Hartwig, Charles Ferdinand	1881
Henes, William Frederick	1876
Hogey, Julius Henry	1880
Jacobus, Judson Schradlow	1870
Jamieson, Thomas Nevin	1888
Johnson, Stuart William	1881
Kadlec, Lawrence Wesley	1880
Kirchgasser, William Charles	1888

Lord, Thomas	1882
Martin, Hugo William Conrad	1881
Maynard, Henry Sherman	1880
Oldberg, Oscar	1873
Parsons, John	1865
Patterson, Theodore Henry	1869
Puchner, William August	1888
Reinhold, William	1866
Rhode, Rudolph Ernst	1887
Sargent, Ezekiel Herbert	1864
Scherer, Andrew	1884
Schmidt, Frederick Michael	1887
Senier, Frederick Sutherland	1874
Sommers, Frank Giddings	1877
Thackeray, William Thomas	1884
Townsend, Abram R	1880
Truax, Charles	1882
WHITFIELD, THOMAS	1865
Wilson, Julius Henry	1869
WOLTERSDORF, LOUIS	1865
Zahn, Emil Augustus	1881

Danville.

Winslow, Edwin Cook	1879

Decatur.

Smith, Alexander Henry	1888

El Paso, Woodford Co.

Strathman, Charles A	1888

Highland.

Knoebel, Edmund	1882
Mueller, Adolphus	1871

Moline.

Sohrbeck, George Henry	1888

Mount Sterling.

Rickey, Charles Francis	1885

Peoria.

Benton, Wilber Merritt	1888
Zimmermann, Charles	1881

Peru, La Salle Co.

Hattenhauer, Robert Christopher	1881

River Forest.

Rose, Ellison Halsey	1880

Springfield.

Day, Charles Wesley	1873

INDIANA.

Bluffton.

Spitzer, George	1888

Bremen.

Miller, Otho Fenn Smith	1885

Columbus.

Stahlhuth, Ernst Henry William	1887

Evansville.

Schmidt, Florian Charles	1882
Schlaepfer, Henry John	1879

Fairmount.

Edwards, Nathan Wilson	1879

Indianapolis.

Browning, Woodville	1882
Dill, John Brown	1878
Eberhardt, Ernest Godlove	1887
Frauer, Herman Emanuel	1881
Hurty, John Newell	1882
Lambert, John Albert	1879
Leist, Jacob Lawrence	1881
Lilly, Eli	1878
Miller, Charles Edward	1880
Schrader, Henry	1869
Sloan, George White	1857
Staley, Michael Conrad	1881

Jasper, Dubois Co.

Mehringer, Joseph Andrew	1882

Jeffersonville.

Loomis, John Clarence	1876

Lafayette.

Green, Arthur Lawrence	1884
Hilt, David	1879
Yeakel, Nathan Webb	1879

Michigan City.

Shrader, John L	1880

New Albany.

Knoefel, August	1879

Richmond, Wayne Co.

Ross, William Henry	1887

Seymour.

Andrews, Josiah Harding	1879

South Bend.

Eliel, Leo	1882

Terre Haute.

Baur, Jacob 1879
Buntin, William Campbell 1874

IOWA.

Ames, Story Co.

Pickett, John Harvey 1887

Cedar Falls, Black Hawk Co.

Bryant, William Cullen 1881

Clinton.

Majer, Oscar 1880

Davenport.

Ballard, John Winthrop 1871
Harrison, Jacob Hugh 1883

Decorah.

Weiser, Emilius Ilgenfritz 1880

Dubuque.

Ruete, Theodore William 1870
Torbert, Willard Horatio 1887

Fort Dodge.

Oleson, Olaf Martin 1877

Fort Madison.

Schafer, George Henry 1871

Iowa City.

Boerner, Emil Louis 1877

Marshalltown.

Upson, Rosa 1887

Monticello.

Soetje, Edward Conrad 1888
Tiarks, Hermann 1876

Muscatine.

Krehe, John Theodor 1884

Pleasantville.

Berringer, Will Jay 1888

Sioux City.

Moore, Silas Harwood 1880
More, Arthur James 1881
Scherling, Gustav 1884

Stuart.

Treat, Joseph Augustus 1885

Washington.

Ink, Parker Peter 1888

Waterloo.

Wangler, Conrad David 1876

KANSAS.

Belle Plaine.

Butler, George Frank 1883

Bridgeport, Saline Co.

Ekstrand, John Peter 1888

Coffeyville.

Slosson, George 1882

Coldwater.

Sombart, John Edward 1881

Lawrence.

Leis, George 1869
Moore, John Thomas 1888
Sayre, Lucius Elmer 1883

Leavenworth.

Brown, Robert J 1862

Lincoln.

Bryant, Randolph Foster 1887

Peabody.

Robert, Daniel John 1881

Perry, Jefferson Co.

Spangler, H. W. 1888

Salina.

Seitz, Oscar 1881

Topeka.

Merrell, Ashbel Hill 1884

Wamego.

Stone, Maurice Lewis 1888

KENTUCKY.

Carrollton.

Geier, Oscar William 1880

Cloverport.

Martin, Charles Carroll 1881

Covington.

Pieck, Edward Ludwig 1887
Zwick, George Albert 1874

Crittenden, Grant Co.

Collins, Richard Durbin 1887

Flemingsburg.

Reynolds, John Jefferson 1876

Frankfort.

Averill, William Henry 1874

Louisvillo.

Barnum, Joseph Powers 1887
Beckmann, Oscar Albert 1879
Colgan, John 1867
Diehl, Conrad Lewis 1863
Dilly, Oscar Charles 1888
Fischer, Phil 1883
Goebel, Edward 1884
Haeusgen, Henry Otto 1888
Jones, Simon Newton 1870
Kessler, Edward Frederick 1879
Mueller, Otto Edward 1888
Newman, George Abner 1866
Peyton, Robert Docker 1887
Pfingst, Edward Charles 1874
PFINGST, FERDINAND JOHN 1867
Pfingst, Henry Adolph 1874
Rademaker, Hermann Henry 1879
Renz, Frederick Jacob 1883
Rogers, Wiley 1874
Scheffer, Emil 1872
Schiemann, Edward Bernard 1880
Schoettlin, Albert John 1882
Snyder, Robert Johnson 1887
Strassel, William 1870

Somerset.

Porter, Chilton Scott 1882

Uniontown.

Hardigg, William Leopold 1881

LOUISIANA.

New Orleans.

Brand, Erich 1888
Brunswig, Lucien Napoleon 1887
Chalin, Louis Fisk 1887
Dellavallade, Jean Michel 1873
Deléry, Edgar 1878
Finlay, Alexander Kirkwood 1883
Godbold, Fabius Chapman 1887
Hall, Charles Knap 1887
Johnson, John 1887
Keene, Thomas Rucker 1888
Keppler, Christian Lewis 1882
Lavigne, Jean Baptiste 1883
Lyons, Isaac Luria 1875
Mellon, John Joseph 1883
Metz, Abraham Louis 1887
Moore, Thomas Ferguson 1878
Robin, Oscar 1887
Rudolf, Mrs. Eliza 1887
Shorb, Joshua Eagan 1883

Baton Rouge.

Brooks, Francis Marion 1879

Bayou Goula.

Viallon, Paul Louis 1870

Franklin.

Frere, Alexander Gabriel 1882

New Iberia.

Lee, James Augustin 1856

Thibodaux.

Thibodeaux, Joseph Theogine . . . 1870

MAINE.

Augusta.

Partridge, Charles Kimball 1867

Bangor.

Harlow, Noah Sparhawk 1859
Sweet, Abel Sylvester, Jr. 1883
Sweet, Caldwell 1881

Bath.

Anderson, Samuel 1876

Belfast.

Moody, Richard Henry 1876

Bethel.

Wiley, Goodwin Robert 1886

Biddeford.

Boynton, Herschel 1875

Ellsworth.

Parcher, George Asa 1875

Pittsfield.

Libby, Henry Fitzgerald 1882

Portland.

Cummings, Henry Thornton 1853
Dana, Edmund, Jr. 1877
Frye, George Carlton 1879
Hay, Henry Homer 1867
Perkins, Benjamin Abbott 1878

MARYLAND.

Baltimore.

Baxley, Jackson Brown	1856
Brack, Charles	1876
Burrough, Horace	1883
Caspari, Charles, Jr	1883
Culbreth, David Marvel Reynolds	1883
Dohme, Charles Emile	1863
Dohme, Lewis	1859
Edwards, William Fletcher	1883
Elliott, Henry Alexander	1859
Emich, Columbus Valentine	1863
Frames, James Parker	1868
Gosman, Adam John	1870
Hancock, John Francis	1863
Jennings, Nathaniel Hynson	1857
Lauer, Michael John	1865
Perkins, Elisha Henry	1857
Russell, Eugene Janus	1856
Sharp, Alpheus Phineas	1855
Simon, William	1885
Thompson, William Silver	1856
Thomsen, John Jacob	1856
Thomsen, John Jacob, Jr	1883
Tilyard, Charles Slade	1867
WINKLEMAN, JOHN HENRY	1864

Chestertown.

Stam, Colin Ferguson	1882

Cnmberland.

Herman, John George	1878
Shriver, Henry	1876
Shryer, Thomas Wilson	1875

Frederick City.

Schley, Steiner	1878

Hagerstown.

Winters, Jonas	1863

MASSACHUSETTS.

Boston.

Appleton, Henry Knox, Jr	1887
Babo, Leopold	1859
Bartlet, William Williams	1875
Bassett, Charles Harrison	1867
Bolles, William Palmer	1875
Boyden, Edward Cleveland	1874
Burley, Edward Porter	1877
Burnett, Joseph	1852
CANNING, HENRY	1865
Carter, Solomon	1865
Chapin, William Arms	1880
Colton, James Byers	1865
Cramer, Max	1881
CUTLER, EDWARD WALDO	1859
Davenport, Bennett Franklin	1879
Dinsmore, George Frederick	1879
Doliber, Thomas	1859
DRURY, LINUS DANA	1871
Durkee, William Carley	1885
Godding, John Granville	1875
Goodale, Thomas Trefethen	1879
Hoyt, George Melvin	1875
Jenkins, Luther Lincoln	1867
Jones, James Taber	1875
Jordan, William Henry	1871
Kelly, Edward Samuel	1871
Lowd, John Colby	1871
Markoe, George Frederic Holmes	1863
Melvin, James Samuel	1853
Metcalf, Theodore	1857
Mowry, Alfred Daniel	1884
O'Brien, James John	1875
Patch, Edgar Leonard	1872
Patten, Ichabod Bartlett	1858
Pierce, William Herbert	1879
Prescott, Horace Augustus	1875
Richardson, William Allen	1887
Sawyer, William Frederick	1885
Sharples, Stephen Paschell	1875
SHEPPARD, SAMUEL AIRUS DARLINGTON	1865
Siegemund, Charles Augustus	1882
Stowell, Daniel	1875
Tower, Levi, Jr	1860
Turner, Thomas Larkin	1853
Williams, George Gorham	1888
Wilson, Benjamin Osgood	1859
Woodbridge. George Washington	1859

Andover.

Parker, George Hawkins	1874

Cambridge.

Hubbard, John Henry	1866
Wood, Edward Stickney	1879

Cambridgeport.

Bayley, Augustus Ramsey	1859
Laing, Alfred Allan	1888
Orne, Joel Stone	1859

Charlestown.

Marshall, Ernest Clifton	1875
Stacey, Benjamin Franklin	1860

Chelsea.

Buck, John	1855
Buck, John Lynian	1883

Dover.

Colcord, Samuel Marshall	1852

East Pepperell.

Denham, Charles Sumner	1875

Fitchburg.

Choate, John	1877
Estabrook, Henry Arthur	1886

Great Barrington.

Whiting, Frederick Theodore	1863

Holyoke.

Ball, Charles Ely	1885

Lawrence.

Whitney, Henry Martin	1859

Lee.

Pease, Francis Merrick	1880

Lowell.

Bailey, Frederick	1869
Butler, Freeman Hall	1874
Hood, Charles Ira	1871
Kidder, Samuel	1859
Robinson, Edward A	1888

Lynn.

Colcord, Joseph Webster	1882

Marlborough.

Hartshorn, Frederick Arthur	1880

Middleboro.

Drake, Charles William	1873

New Bedford.

Blake, James Edwin	1866
Bunker, Elihu	1885
Hadley, Frank Rufus	1872
Lawton, Charles Henry	1873
Lawton, Horace Allen	1873
Shurtleff, Israel Hammond	1875
Taylor, John Pitman	1875
Wright, Edward Ellsworth	1886

Newburyport.

Goodwin, William W	1853
Homer, John	1887

Newton.

Hudson, Arthur	1882

Newton Centre.

Noble, John Joseph	1875

North Andover.

Berrian, George Washington	1857

Peabody.

Grosvenor, Daniel Prescott	1881

Pittsfield.

Atwood, Luther Lee	1876

Quincy.

Whall, Joseph Stokes	1873

Rockland.

Easton, Luther Waite	1875
Estes, Joseph Joslyn	1870

Rockport.

Blatchford, Eben	1857

Salem.

Luscomb, William Edmund	1881
Nichols, Thomas Boyden	1876
Price, Charles Henry	1882
Price, Joseph	1888

Shelbourne Falls.

Baker, Edwin	1875

Somerville.

Cowdin, George Henry	1875
Flanagan, Lewis Cass	1875

Stockbridge.

Clark, William Bills	1880

Taunton.

Drown, Lowell Appleton	1883

Walpole.

Pilsbury, Frank Otis	1881

West Acton.

Hutchins, Isaiah	1880

Worcester.

Bush, William	1875
Scott, George Theodore	1883
Williams, Duane Burnett	1881

MICHIGAN.

Ann Arbor.

Brown, Henry Jefferson	1882
Eberbach, Ottmar.	1869
Garrigues, Samuel Smith	1855
Prescott, Albert Benjamin	1871
Schlotterbeck, Julius Otto	1888
Stevens, Alonzo Burdette	1885

Battle Creek.

Wardell, Robert C.	1860

Benton Harbor.

Sheffield, William Edurn	1887

Berrien Springs.

Kephart, Henry	1887

Detroit.

Allen, Albert William	1885
Allen, William Humphries	1887
Baier, Charles George.	1887
Bassett, Arthur	1888
Caldwell, James William	1875
Dupont, William	1887
Frizelle, Seymour Fuller	1888
Hawkins, Henry	1880
Haynes, David Oliphant	1887
Holt, Alvin Everett	1888
Inglis, Frank.	1887
Johnston, William, Jr.	1888
Kennedy, Ezra Joseph	1887
Lyons, Albert Byron	1885
Perry, Frederick William Riley	1885
Snow, Herbert Waldemar	1887
Stearns, Henry Albyn	1888
Stevens, Fred. D.	1888
Stone, Clarence George	1884
Thompson, Frank Augustus	1888
Vernor, James	1866
Wagner, George William, Jr.	1888
Webber, Joseph Le Roy	1886

East Saginaw.

Melchers, Henry	1869
Prall, Delbert Elwyn	1876

Grand Rapids.

Tibbs, William Henry	1871

Greenville.

Hall, William Alanson	1888

Holly.

Church, Howard Montague	1887

Ionia.

Gundrum, George.	1882

Jackson.

Latimer, Robert Fulton	1857

Kalamazoo.

McDonald, George	1871

Loomis, Isabella Co.

Taylor, Celia Williams.	1888

Manistee.

Lyman. Asahel Hubert	1884

Muskegon.

Brundage, Fred.	1888
Jesson, Jacob.	1872
Padley, William Alfred	1888

Nottawa, St. Joseph Co.

Todd, Albert May	1885

Owosso.

Parkill, Stanley E.	1887

Red Jacket, Houghton Co.

Macdonald, Daniel Turner	1884

Saginaw City.

Keeler, William Henry	1872

MINNESOTA.

Minneapolis.

Allen, E. Floyd.	1885
Huhn, George	1884
Sanderson, Stephen Francis	1880

St. Paul.

Conger, Frederic Albert	1887
Simmon, Karl	1880
Stierle, Adolph	1882
Sweeny, Robert Ormsby	1866
Warren, Edwin Alonzo	1887
Wilkes, Arthur Perry	1887

Spring Valley.

Rohde, Claus Frederick	1885

Stillwater.

Hening, James Courtenay	1887

MISSISSIPPI.

Aberdeen, Monroe Co.

Cordon, John Gray Myers	1882
Eckford, Joseph William.	1883
Tindall, Graham McFarland	1880

Jackson.

Ash, Matthew Franklin	1856

Port Gibson.

Shreve, John Alexander	1880

MISSOURI.

St. Louis.

Ahlbrandt, Henry Ernst	1877
Alexander, Maurice William	1871
Ault, Charles Henry	1887
Blank, Alois	1881
Boehm, Solomon	1871
Catlin, Ephron	1871
Chamberlain, Guilfoad Tracy.	1853
Curtman, Charles Otto	1871
Good, James Michener.	1871
Grandjean, Charles	1871
Grandjean, Eugene	1871
Haigh, De Lagnel	1887
Hassebrock, Henry Fred.	1884
Hemm, Francis.	1881
James, Frank Lowber	1888
Klie, George Henry Charles	1878
Leitch, Aythur	1860
Mallinckrodt, Edward.	1869
Meyer, Christian Fred. Gottlieb	1860
Morley, William Jarman	1876
Pauley, Frank Charles	1879
Physick, Henry Sandford	1870
Richardsou, James	1882
Richardson, Joseph Clifford.	1871
Rohlfing, Charles Henry Ferdinand	1888
Sander, Enno	1858
Scheffer, Henry William	1863
Sennewald, Ferdinand William	1865
Sohn, Frank	1888
Tomfohrde, John William	1878
Ude, George	1871
Uhlich, Ferdinand G.	1881
Vordick, August Henry	1874
Wall, Otto Augustus.	1884
Westmann, Frank Henry.	1882
Whelpley, Henry Milton	1887
Whitcomb, Frederick Ezekiel	1888

Carrollton.

Pettit, Henry McEwen.	1860

Carthage.

Caffee, Amos Henry.	1886

Freeman.

Dohan, Frank Linley	1888

Glenwood.

Gray, Gilbert Dillon.	1881

Independence.

Wright, Oscar Martin	1887

Kansas City.

Arnold, Henry Clay.	1881
Ford, William Thomas.	1878
Gallagher, John Anthony.	1881
Graham, Willis Hamm	1881
Lahme, Charles Adolph	1881
Young, Joel Judson	1881

Marshall.

Franklin, Philip Henry	1881

Mexico, Audrain Co.

Duncan, Thurston Baskett	1887
Llewellyn, John Frederick	1867

Moberly, Randolph Co.

Last, Louis Christopher August	1888

Pierce City, Lawrence Co.

Armstrong, George Revington.	1877

Rich Hill.

Youngs, William	1883

Sedalia.

Fleischmann, Augustus Theodore	1885

Weston.

Parr, John Conrad	1856

NEBRASKA.

North Bend.

Seykora, Edward Joseph.	1887

Omaha.

Boyce, Samuel F	1871
Field, Amos	1871
Goodman, Charles Frederick	1871
Kennard, Frank Bartlett	1883
Kuhn, Norman Archibald	1878

NEVADA.

Virginia City.

Perkins, William Alexander 1869

NEW HAMPSHIRE.

Claremont.

Spofford, Charles Byron 1884

Dover.

TUFTS, CHARLES AUGUSTUS 1856

Greenville.

Hall, Charles Edwin 1884

Keene.

Hodgkins, Bert Willis 1888

Lake Village.

Dolloff, Albert Simeon 1888

Manchester.

Miville, Francis Charles 1877

Nashua.

Morse, Charles Milan 1888
Russell, Elias Smith 1875
Whitman, Nelson Samuel 1875

New Market.

Dearborn, George Luther 1853

Portsmouth.

Green, Benjamin 1888
Preston, Andrew Peabody 1881

Somersworth.

Moore, George 1859

NEW JERSEY.

Asbury Park.

Woolley, Stephen Disbrow 1888

Bloomfield.

Scherff, John Philip 1877

Bordentown.

Carslake, George Middleton 1880

Burlington.

Vandegrift, John A 1867

Camden.

Brown, Albert Potts. 1870
Hutchison, Hazard Snowden 1885
Test, Alfred William 1870

East Orange.

Davis, George Randolph 1883
Niblo, William Henry 1887

Elizabeth.

Brant, Edmund Wade 1882
Drake, Jonathan Baker 1875
Kent, Henry Avery, Jr 1880
Loveland, William F 1882
Oliver, William Murray 1875

Elizabethport.

Frohwein, Richard 1867

Englewood.

Rockefeller, Lucius 1880

Freehold.

Walker, Ansell 1880
Walker, John Putnam 1881

Hoboken.

KLUSSMAN, HERMANN 1876

Jersey City.

Abernethy, Maxwell 1865
Brown, James 1888
Dougherty, Samuel Edward 1875
Kennedy, Ewen Chisholm 1888
Turner, Isaac Worthington 1882
White, George Henderson 1868
Wienges, Conrad 1875

Keyport.

Warn, William Edgar 1886

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Montclair.

Tobin, James Martin 1887

Morristown.

Carrell, Eugene Ayres 1875
Dalrymple, Charles Hoagland . . . 1882

Mt. Holly.

WHITE, AARON SMITH 1860

Newark.

Betzler, Jacob 1880
Bruguier, Francis 1876
Drescher, August 1886

HOLZHAUER, CHARLES	1873
Mennen, Gerhard	1888
Sayre, Edward Augustus	1877
Sayre, William Henry	1877
Smith, Charles Bradley	1868
Smith, Israel Preston	1876
Stamford, William Harrison	1876
Van Winkle, Abraham	1871

New Brunswick.

Kilmer, Frederic Barnett	1886
Rust, William	1870

Newton.

Ryerson, Henry Ogden	1882

Orange.

Musler, Abram	1883

Orange Valley, Essex Co.

Yatman, John Lewis	1880

Plainfield.

Miller, Joseph Gilbert	1886
Reynolds, Howard Prescott	1875
Shaw, Robert Johnston	1875

Red Bank, Monmouth Co.

Nicholas, William Charles	1884

Roselle.

Tiernan, Frank Mortimer	1880

Salem.

Bassett, Joseph	1880

Somerville.

Cook, Gilbert Snowden	1886

South Amboy.

JACQUES, GEORGE WASHINGTON	1869

Trenton.

DeCou, James Clarke	1880

NEW MEXICO.

Las Vegas.

Zimmermann, John Lucius	1883

NEW YORK.

New York City.

Atwood, Herman White	1873
Balluff, Paul	1860
Balser, Gustavus	1875
Bedford, Peter Wendover	1859
Bendiner, Samuel Julius	1882
Billings, Henry Merry	1869
Campbell, Horace Willard	1875
Chandler, Charles Frederic	1867
Davis, Benjamin	1869
Deitz, Charles Jacob	1888
Dick, Dundas	1879
Ditman, Andrew Jackson	1868
Dudley, Oscar Earle	1877
Eimer, Charles	1872
Fairchild, Benjamin Thomas	1875
Fairchild, Samuel William	1887
Fink, Frederick William	1886
Fisher, William	1862
Fougera, Charles Edmond	1867
Foulke, James	1881
Fraser, Edward Allen	1873
Fraser, Horatio Nelson	1888
Fuller, Henry Weld	1865
Gardner, Robert Winslow	1867
Giles, William Michael	1888
Gilmore, John Wesley	1872
Griffith, Albert Richard	1870
Hauenstein, William	1883
Hays, Benjamin Franklin	1886
Hays, David	1867
Hegeman, Johnson Niven	1880
Herzfeld, Herman	1885
Higgins, James Starkey	1862
Hoffmann, Frederick	1867
Hohenthal, Charles Frederick Lebe-recht	1865
Hudnut, Alexander	1857
Hughes, Albert Ernest	1888
Ihlefeld, Conrad Heinrich	1881
Jungmann, Julius	1879
Kalish, Julius	1875
Kemp, Edward	1888
Knapp, Frank Fiero	1880
Lazell, Lewis Thurber	1858
Maclagan, Henry	1883
Macmahan, Thomas Jackson	1871
Main, Thomas Francis	1872
Massey, William Morton	1885
McIntyre, Byron Floyd	1876
McIntyre, Ewen	1873
McKesson, George Clinton	1888
McKesson, John, Jr	1867
MILHAU, EDWARD LEON	1858
Molwitz Ernest	1867
O'Neil, Henry Maurice	1879
Osmun, Charles Alvin	1868

Painter, Emlen	1870
Peixotto, Moses Levi Maduro	1869
Pfingsten, Gustavus	1873
Quackinbush, Benjamin Franklin	1886
Ramsperger, Gustavus	1860
Reichard, Frederick Alfred	1871
Rice, Charles	1870
Ricksecker, Theodore	1870
Robbins, Charles Albert	1876
Sands, George Gedney	1867
Schmid, Henry	1886
Schmidt, Ferdinand Traugott	1887
Scofield, James Stephen	1867
Seabury, George John	1876
Sheils, George Emanuel	1860
Skelly, James Joseph	1866
Starr, Thomas	1870
Tscheppe, Adolph	1876
Vennard, William Lawrence	1888
Weinman, Oscar Christian	1873
Wichelus, Frederick	1881
Wickham, William Hull	1870
Williams, Seward Whiting	1887
Wilson, William	1876
Wohlfarth, Justin	1879

Brooklyn.

Aspinall, Walter Albert	1880
Benjamin, James Henry	1878
Brooks, George Washington	1879
Close, George Cassidy	1858
Curtiss, Charles Grenville	1866
Cutts, Foxwell Curtiss, Jr	1875
Davis, William Mortimer	1879
Day, Carlos Erastus	1870
DeForest, William Pendleton	1879
Dennin, Charles	1875
Douglas, Henry, Jr	1875
Dunn, John Augustus	1867
Du Puy, Eugene	1852
Eccles, Robert Gibson	1885
Haviland, Henry	1857
Heydenreich, Emile	1867
Jones, Thomas	1868
Kitchen, Charles William	1865
Krieger, Philip	1876
Lehn, Louis	1874
Levy, Adolph	1877
Livingston, Barent Van Buren	1872
McElhenie, Thomas Diamond	1872
Menninger, Henry Joseph	1866
Newman, George Anthony	1865
Nicot, Louis Emile	1875
Niebrugge, John August	1861
Ollif, James Henry	1867
Owens, Richard John	1860
Pyle, Cyrus	1859
Reusch, Ernst	1882
Reynolds, Charles Edward	1882
Rumsey, Samuel Louis	1876
Snyder, Ambrose Chancellor	1867
Squibb, Edward Hamilton	1882
Squibb, Edward Robinson	1858
Stevens, Luther Fuller	1879
Strachan, William Edward	1880
Underhill, Joseph Garness	1879
Wackerbarth, John	1883
Wynn, William	1867
Zellhoefer, George	1876

Albany.

Clement, Henry Bratt	1880
French, William Barker	1880
Gaus, Charles Henry	1879
Gaus, Louis Henry	1880
Gibson, Charles	1880
Huested, Alfred Birch	1879
McClure, William Henry	1880
Michaelis, Gustavus	1882
Sauter, Louis	1879
Turner, George Heather	1880
Walker, William John	1880
Wheeler, Leonard Hiram	1883

Auburn.

Stanley, Edgar Clark	1880

Binghamton.

Otis, Clark Zelotes	1886

Buffalo.

Drefs, Charles Adams	1882
Gregory, Willis George	1886
Hayes, Horace Phillips	1880
Mosher, Rosa Belle	1888
Peabody, William Huntington	1857
Rano, Charles Orlando	1866

Catskill.

Du Bois, William Laneman	1880

Cohoes, Albany Co.

Travis, J. Walton	1888

Croton Landing.

Henry, Charles (Dworniczak)	1881

Elmira.

Holmes, Clayton Wood 1873

Fishkill on Hudson.

Moith, Augustus Theodore 1860

Flushing.

Hepburn, John 1873
James, William Tefft 1882

Geneseo, Livingston Co.

Rogers, Arthur Henry 1882

Gloversville, Fulton Co.

Miller, Jason Albert 1879
Van Auken, Jerrie A 1880

Hannibal.

Brewster, Wadsworth J 1880

Holley, Orleans Co.

Bishop, Francis Myron 1882

Jamaica, Queens Co.

Boylis, Lewis Fosdick 1880
Goodale, Harvey Galusha 1879
Peck, George Lyman 1883

Kingston.

Dedrick, William Frederick 1884

Lockport.

Sweet, Frederick K. 1880

Malone.

Miller, Robert McCleferty 1880

Middletown.

King, James Theodore 1859
Rogers, William Henry 1869

Mount Vernon.

Gill, George 1872

Newburgh.

Chapman, Isaac Close 1887
Tartiss, Alfred Joseph 1867

Niagara Falls.

Griffith, Hiram Elijah 1875

Nyack, Rockland Co.

De Graff, David 1879

Olean.

Coon, James Van Deventer 1880

Oswego.

Butler, Charles Henry 1887

Plattsburgh.

Smith, Jay Hungerford 1883

Port Chester.

Hyler, William Henry 1875

Port Jervis.

Cook, George Edward 1872

Potsdam.

Thatcher, Hervey Dexter 1865

Richfield Springs.

Smith, Willard Alfred 1880

Rochester.

Aman, Henry 1882
Davis, Edward Hatch 1880
Haas, George Herman 1872
Paine, James Dixon 1857
Schmitt, Joseph Max 1882
Smith, Willard 1880

Rome.

Bissell, John Gordon 1875
Owens, James Alanson 1882

Sand Bank.

Rich, Willis Simmons 1882

Saratoga Springs.

Fish, Charles Frederick 1866
Mingay, James 1873
Pennington, Thomas Henry Sands. . 1877

Schenectady.

Hanson, Willis Tracy 1880

Stillwater, Saratoga Co.

Schermerhorn, Winfield Scott 1880

Syracuse.

Dawson, Edward Seymour, Jr. . . . 1876
Snow, Charles Wesley 1876

Tonawanda, Erie Co.

Scoville, Charles Henry 1882

Utica.

Blaikie, William 1879
Cone, John Wright 1876

Waterville, Oneida Co.

Bissell, Emery Gilbert 1879

Wellsville, Allegheny Co.

Hall, Edwin Bradford 1879

Yonkers.

Eschman, Frederick William Rudolf . 1880
Wray, George Brown 1888

NORTH CAROLINA.

Chapel Hill.

Saunders, Richard Banbury 1858

Charlotte.

Wearn, William Henry 1888

Durham, Orange Co.

Vaughan, Parry Wyche 1882

Fayetteville.

Hinsdale, Samuel Johnson 1875
Sedberry, Bond English 1882

New Berne.

Hancock, Franklin Wills. 1888

Oxford.

Crawford, Thomas Dalzell 1888

Raleigh.

Lee, Addison Sherwin 1873
Simpson, William 1873

Tarboro.

Zoeller, Edward Victor 1878

Washington.

Gallagher, Charles Kewell 1857

Wilmington.

Hardin, John Haywood 1881
Munds, James Cassidy. 1878

OHIO.

Cincinnati.

Bain, Andrew Watson 1874
Betz, Otto Edward 1887
Crowther, Frederick Augustine . . . 1887
De Lang, Alfred 1887
Eger, George. 1864
Elfers, Joseph Clemens 1864
Fennel, Charles Theodore Piderit . . 1886
Goodman, Emanuel 1879
Gordon, William John Maclester . . 1854
Greve, Theodore Lund August . . . 1864
Greyer, Julius 1880
Heineman, Otto 1864
Heun, Emil 1881
Hildreth, Newton Gough 1879
Hoffman, Julius 1887
Judge, John French 1866
Karmann, William 1864
Klayer, Louis 1884
Koehnken, Herman Henry. 1875
Lammert, Cyrus Joseph 1881
Lloyd, John Uri 1870
Martin, William James. 1881
Meininger, Albert. 1881
Merrell, Charles George 1888
Merrell, George 1879
Norwood, Theodore Franklin. . . . 1887
Phillips, Charles Wilson 1881
Rendigs, Charles Peter. 1876
Ruppert, John 1880
Sauer, Louis Wendlin 1882
Schreck, Leocadio Santos 1881
Serodino, Herman 1880
Simonson, William 1887
Vilter, Herman 1881
Wagner, Henry. 1876
Walton, Harry Clifford. 1881
Wells, Jacob David 1864
Wetterstrom, Albert Frederick Charles 1888
Yorston, Matthew Mackey 1864
Zuenkeler, John Ferdinand. 1887

Ada, Hardin Co.

Ashbrook, Charles Shaw 1887

Akron.

Armstrong, Andrew Moorehouse . . 1876
Inman, Charles Trask 1885
Smith, Joseph Stahle 1878

Bryan.

Snyder, Alva Leach. 1873

Canton.

McFarland, Thaddeus Day 1887

Chillicothe.

Howson, Arthur Bayshawe 1886
Howson, Walter Henry 1875
Nipgen, John Alvin 1879

Circleville.

Evans, Samuel Barlow. 1881

Cleveland.

Asplin, John Harding	1882
Biddle, Herbert George	1888
Bruce, James	1882
Cobb, Ralph Lathrop	1883
Dreher, Louis	1881
Feil, Joseph	1885
Fischer, Emil A.	1887
Fischer, Henry John	1888
Gaylord, Henry Cleveland	1869
Gegelein, Frederick Leonhardt	1881
Glines, George Walter	1881
Grosse, Gottlieb Matthew	1888
Haber, Louis Anthony	1881
Hahn, Sigismund Joseph Frederick	1887
Hechler, George Louis	1882
Hopp, Lewis Christopher	1876
Kuhlmeier, Henry	1888
Lehr, Philip	1885
May, Arthur Ferdinand	1881
Mayell, Alfred	1872
Myers, Daniel	1882
Parsons, Richard	1882
Rosenwasser, Nathan	1880
Schambs, George Matthias	1882
Schellentrager, Ernst August	1882
Scott, William Johnson	1872
Slosson, Frank West	1882
Smithnight, Albert	1882
Spenzer, Peter Ignatius	1872
Urban, Jacob Philip	1881
Voss, George William	1885

Columbiana.

Ink, Charles Elliott	1885

Columbus.

Bruck, Philip Henry	1884
Cook, Harry Clifford	1887
Herbst, Frederick William	1882
Hoffman, Otto Louis	1883
Huston, Charles	1872
Karb, George James	1883
Kauffman, George Beecher	1882
Schueller, Ernst	1881
Schueller, Frederick William	1880
Sherwood, Louis Walker	1882

Dayton.

Burkhart, Mark Anthony	1887
Kurfurst, Henry Ferdinand	1881
Spengler, John George	1887
Weusthoff, Otto Sittel	1879

Delhi, Hamilton Co.

Carpenter, Samuel William	1883

Delphos.

Wahmhoff, Julius Henry	1880

Gallipolis.

Schaf, Justus Henry	1875

Glendale. Hamilton Co.

Feemster, Joseph Hall	1873

Grand Rapids, Wood Co.

Thurston, Azor	1886

Logan.

Harrington, Frank	1869

Massillon, Stark Co.

Baltzly, Zachariah Taylor	1876
Kirchhofer, Peter Paul	1881

Medina.

Albro, Willis Henry	1887

Middletown.

Johnson, Charles Brayton	1876

Navarre.

Grossklaus, John Ferdinand	1859

North Baltimore, Wood Co.

Clark, Frank P.	1882

Norwood, Hamilton Co.

Weyer, John	1887

Salem, Columbiana Co.

Hawkins, Michael Smith	1870

Springfield.

Casper, Thomas Jefferson	1867
Ludlow, Charles	1872
Siegenthaler, Harvey N.	1882

Tiffin.

Fleck, Jacob J.	1883
Marquardt, Jacob Frederick	1881

Toledo.

Hohley, Charles	1872
Reed, Isaac Newton	1881

Troy.

Tobey, Charles William	1879

Washington Court House.

Boyer, Harry	1887

Watertown.

Bohl, Conrad	1881

Wooster.

Ohliger, Lewis Philip	1871

Youngstown, Mahoning Co.

Erwin, James Jay	1888

Zanesville.

Hatton, Edgar Melville	1878

OREGON.

Portland.

Sitton, Charles Edward	1878

PENNSYLVANIA.

Philadelphia.

Angney, John R.	1867
Baker, Walter Theron	1885
Bauer, Louis Gustavus	1867
Blair, Andrew	1865
Blair, Henry Cowen	1868
Borell, Henry Augustus	1874
Boring, Edward McCurdy	1867
Bostick, Elmer Ellsworth	1888
Bower, Henry	1860
Bower, Henry Albert	1868
Bullock, Charles	1857
Bunting, Samuel Sellers	1857
Burg, John Dellinger	1888
Campbell, Samuel	1864
Cook, Thomas Penrose	1877
Dobbins, Edward Tompkins	1867
Eberle, Charles Louis	1865
Eddy, Henry Clay	1869
Ellis, Evan Tyson	1857
England, Robert	1868
Fox, Peter Paul	1869
Fruh, Carl Daniel Stephan	1876
Gerhard, Samuel	1873
Grahame, Israel Janney	1856
Grove, John Eberly	1868
Haenchen, Charles Eugene	1865
Hance, Edward Hance	1857
Hancock, Charles West	1868
Hanson, Arthur Edward	1888
Hassinger, Samuel Ellphat Reed	1880
Heintzelman, Joseph Augustus	1858
Hoskinson, John Thomas, Jr.	1881
Jenks, William Jenks	1858
Jones, Alexander Henry	1874
Jones, Daniel Sexton	1859
JONES, EDWARD CHARLES	1864
Keeney, Caleb Reynolds	1868
Keys, Roger	1868
Kline, Mahlon Norwood	1876
Koch, Louis	1872
Krewson, William Egbert	1875
MAISCH, JOHN M.	1856
McIntyre, William	1868
McKelway, George Irwin	1874
Mellor, Alfred	1864
Miller, Adolph William	1868
Milligan, Decatur	1867
Moore, Joachim Bonaparte	1860
Morris, Lemuel Iorwerth	1880
Murray, Bernard James	1882
Newbold, Thomas Mitchell	1876
Ottinger, James Jeremiah	1876
Perot, Thomas Morris	1857
Pile, Gustavus	1881
Post, Elisha	1876
Preston, David	1868
Procter, Wallace	1874
REMINGTON, JOSEPH PRICE	1867
Riley, Charles William	1868
Rittenhouse, Henry Norman	1857
Robbins, Alonzo	1865
Rosengarten, Mitchell George	1869
Shinn, James Thornton	1860
Shivers, Charles	1860
Shoemaker, Richard Martin	1869
Spannagel, Charles Christian	1874
Stryker, Cornelius Whitenack	1886
Taylor, Alfred Bower	1852
Thompson, William Beatty	1858
Trimble, Henry	1876
Walch, Robert Henry	1879
Warner, William Richard	1857
Webb, William Henry	1867
Weber, William	1872
Weidemann, Charles Alexander	1868
Wendel, Henry Edward	1873
Wiegand, Thomas Snowdon	1857
Wolfe, Nathaniel	1878
Wright, Archibald Wesley	1868
Zeilin, John Henry	1859

Allegheny City.

Armor, Alpheus	1882
Eggers, Frederick Hermann	1872
Keck, William Hugus	1885
Slocum, Frank Leroy	1880

Allentown.

Klump, Charles Christian 1880

Ambler, Montgomery Co.

Keasbey, Henry Griffith 1873
Mattison, Richard Vornselons 1873

Beaver, Beaver Co.

Andriessen, Hugo 1875

Bellefonte, Centre Co.

Zeller, William Samuel 1881

Bristol.

Pursell, Howard. 1880
Young, John Kroesen 1887

Carlisle.

Horn, Wilbur Fisk. 1876

Centralia.

Finnerty, Edward John, Jr. 1887

Chambersburg.

Cressler, Charles Henry 1868

Derry Station.

Thomas, George Massena 1883

Easton.

Weaver, John Archibald 1873

Franklin.

Riesenman, Joseph 1883

Hanover, York Co.

Eckert, Edwin Gilbert 1883
Sniveley, Andrew Jackson 1883

Harrisburg.

George, Charles Theodore 1873
Gorgas, George Albert 1884
Gross, Edward Ziegler 1883
Miller, Jacob Augustus 1873
Weills, William Melanchthon Luther, 1885

Hyde Parke, Scranton, Luzerne Co.

Morgan, Benjamin George 1876

Lancaster.

HEINITSH, CHARLES AUGUSTUS . . . 1857

Lebanon.

LEMBERGER, JOSEPH LYON 1858
Redsecker, Jacob Henry 1881

Lock Haven.

Prieson, Adolph 1880

Mansfield, Tioga Co.

Ridgway, Lemuel Augustus 1882

Milton.

Alleman, Emanuel Allison 1880

Minersville.

Burns, John Kellar 1876

Mt. Pleasant, Westmoreland Co.

McElwee, Emer Judson 1888

Norristown.

Poley, Francis Heury 1880
Stahler, William 1880

Oil City.

Krosskop, William Burton 1887

Osceola Mills.

Campbell, Hugh 1876

Pittsburgh.

Beach, Clifton Hilliard 1883
Cherry, James Bonbright 1868
Emanuel, Louis 1878
Henderson, Archibald Keys 1888
Holland, Samuel Smith 1876
Kelly, George Armstrong 1882
Kerr, James, Jr. 1876
Nisbet, William Washington 1883
Robertson, Archibald Craig 1882
Stevens, Salmon Henry 1885
Todd, William James 1885
Wilson, Albert Hemphill 1883

Pittston.

Rhoades, Stephen Howard 1876

Pottsville.

Deibert, Thomas Irvin 1882
Kennedy, George Washington . . . 1869

Reading.

Fox, Daniel Soder 1872
Smith, Stephen Douglas 1883
Stein, Jacob Henry 1869
Ziegler, Philip Milton 1867

Schuylkill Haven.

Commings, Charles Samuel 1888

Scottdale, Westmoreland Co.

Aubley, Samuel 1888
Cummings, Theodore Foster 1882

Hodgkins, Israel Marion	1887
McNeil, John Murray	1882

Shamokin.

Smink, William Henry R.	1885

Shenandoah, Schuylkill Co.

McCarthy, Cornelius Joseph	1886

Shippensburg.

Fleming, Frank Byerly	1883

Towanda.

Porter, Henry Carroll	1880

West Chester.

Evans, Joseph Spragg	1877

White Haven.

Driggs, Charles M.	1881

Wilkes-Barre.

Jones, Samuel Stephen	1887

Williamsport.

Cornell, Edward Augustus	1873
Duble, Jesse Balderston	1870
Hill, Justin Luther	1887

York.

Patton, John Franklin	1880

RHODE ISLAND.

Newport.

Cole, Charles Mowry	1888
Cotton, William Henry	1885
Downing, Benjamin Franklin, Jr.	1886
Taylor, James Henry	1875
Wellington, Arthur Wellesley	1886

Pawtucket.

Jillson, Frederick Winfield	1887

Providence.

Alfreds, Henry James	1883
Blanding, William Bullock	1875
Calder, Albert Layton	1859
Cates, William Everett	1888
Danforth, Edmund Culver	1878
Fenner, Alexander Wilson	1888
Greene, William Ray	1883
Leith, Harvey Isaac	1883
Mason, Norman Nelson	1875
O'Hare, James	1888
Reynolds, William Keyes	1876
Walling, Walter Augustus	1886
Wood, Mason Bowen	1882

Westerley.

Collins, Albert Burlingame	1882

SOUTH CAROLINA.

Charleston.

Aimar, Charles Pons	1879
Burnham, Edward Steinmeyer	1874
Eckel, Augustus William	1874
Marsteller, George Ludwig	1883
Michaelis, Charles Otto	1874
Panknin, Charles Frederick	1874

Columbia.

Thomas, Oscar Ernest	1882

TENNESSEE.

Chattanooga.

Greve, Charles Mathias	1887

Knoxville.

Yeager, Alvin Adams	1888

Memphis.

Robinson, James Scott	1869

Nashville.

Burge, James Oscar	1878
Laurent, Eugene Leonard	1872
Rascoe, Lucius	1887
Thomas, James, Jr.	1875
Thompson, James Ligon	1888
Watson, William Harry	1887
Wharton, John Criddle	1872
Wharton, William Henry	1876

TEXAS.

Dallas.

Weichsel, Francis	1881

El Paso.

Irvin, William Armstrong	1879

Fort Worth.

Harper, Harry Winston	1881
Powell, Thomas Wallace	1874
Wells, Ebenezer Miller	1878

Galveston.

Keller, Frederick Philander Peter	1888
Preston, Calvin Walbridge	1884

Marshall.

Lancaster, Edwin Walter 1884

Perry.

King, Walter Blackburn 1883

San Antonio.

Kennedy, James 1887

VERMONT.

Brandon.

Crossman, George Alvin 1872

Morrisville.

Gates, Amasa Oscar 1876

St. Johnsbury.

Bingham, Charles Calvin 1875

White River Junction.

Trask, Charles Mitchell 1875

Windsor.

Paine, Milton Kendall 1875

VIRGINIA.

Danville.

Cole, Howson White 1882

Fredericksburg.

Hall, Marshall Carter 1870

Lynchburg.

Craighill, Edward Addison 1888

Norfolk.

Jackson, Edward Calvert 1883
Masi, Frederick Henry 1873

Petersburg.

Beckwith, Edmund Ruffin 1886
Knock, Thomas Franklin 1882

Richmond.

Baker, Thomas Roberts 1873
Scott, William Henry 1873

WASHINGTON TERRITORY.

Seattle.

Kellogg, Gardner 1882

Walla Walla.

Holmes, Henry Elliott 1880

WEST VIRGINIA.

Charleston, Kanawha Co.

Boggs, Edwin Leslie 1872
Potterfield, Clarence Asbury 1882

Wheeling.

Bocking, Edmund 1874
Gray, William Howlett 1880
Menkemeller, Charles 1880
Williams, William Hudson 1880

WISCONSIN.

Beloit.

Fenton, Franklin Sprague 1881

Eau Claire.

Godding, Edward Robert 1884

Fountain City.

Bechman, Charles Richard 1882

Janesville.

Prentice, Fred. F. 1876

Lake Geneva.

Miner, Maurice Ashbel 1880

La Crosse.

Beyschlag, Charles 1880

Madison.

Bernhard, Charles Henry 1888
Hollister, Albert Henry 1884
Power, Frederick Belding 1872

Mayville, Dodge Co.

Sauerhering, Rudolph Aurelius . . . 1884

Milwaukee.

Conrath, Adam 1881
Crolius, Frank Marcelous 1884
Dadd, John Alfred 1880
Drake, John Ransom 1860
Kienth, Hans 1884
Meissner, Paul Ernest 1888
Schrank, Charles Henry 1876

Neillsville.

Sniteman, Charles Clarence 1881

BERMUDA.

Hamilton.

Heyl, James Bell	1863

COSTA RICA.

San José.

Hermann, Frederick Francis	1888

DOMINION OF CANADA.

NOVA SCOTIA.

Antigonishe.

Copeland, John David	1888

Halifax.

Simson, Francis Cook	1876

Kentville.

Masters, Robert Silas	1883

Pictou.

Fraser, Robert Peden	1885

ONTARIO.

Goderich.

Jordan, Frederick Francis	1877

Lindsay.

Gregory, Edmund	1875

Ottawa.

Saunders, William	1860

St. Thomas.

Foster, William Orrville	1881

Stratford.

Waugh, George James	1862

Toronto.

Lander, John Cambridge	1877
Lowden, John	1875
Robinson, William Sherlock	1877

Windsor.

D'Avignon, John Eugene	1888

PRINCE EDWARD ISLAND.

Charlottetown.

Dodd, Simon Walker	1884

QUEBEC.

Montreal.

Gray, Henry Robert	1867
Lachance, Seraphin	1888

Quebec.

Morrison, Joseph Edward	1888

Three Rivers.

Williams, Richard Wellington	1883

MEMBERS RESIDING IN EUROPE.

Burroughs, Silas Mainvielle, London, England	1876
Coblentz, Virgil, Strassburg, Germany	1882
Kremers, Edward, Bonn, Germany	1887
Maisch, Henry Charles Christian, Göttingen, Germany	1885
Mason, Alfred Henry, London, England	1884
Wellcome, Henry Solomon, London, England	1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Carraway, Davis Stephens	1887
Crona, Sixtus Ewald Seine	1885
Hale, Frederick	1855

ALPHABETICAL LIST OF MEMBERS

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Arnold, Robert B.†
Baumgartner, Frederick†
Brown, Clarence E.†
Eberle, Herman T.†
Emerson, Charles B.*
Finlay, John P.*
Garrison, Herod D.†
Hatch, Eugene F.†
James, George R.†
Kannal, Emmet.‡
Lohman, George H.†
Mack, Adolph.†
Martin, Emil.‡
Meyers, James A.*
Morrell, M. Helen.‡
Mott, George F.†
Mueller, Louis H.†
Orne, Charles P.‡
Perry, Bayard T.†
Reiss, Edward C.*
Richardson, Frank.*
Riddell, James A.†
Roth, Eugene N.†
Shedd, Edwin W.*
Simpson, William.†
Sutton, Peter P.†
Thatcher, Joseph H.‡
Tuska, David.‡
Ubert, Julius C.†
Wanier, George S.†
Webb, John A.†
Weiser, Albert.†
Young, Alexander T.†

* Inability to attend the meetings. † No reason given. ‡ Left the business.

LIST OF DECEASED MEMBERS,

Since the last meeting notice of the death of the following members has been received:

Lorenz Blahnik,	Chicago, Ill.	Elected	1881
John Carle, Jr.,	New York.	“	1860
William M. Dale,	Chicago, Ill.	“	1880
Hiram E. Griffith,	Niagara Falls, N. Y.	“	1875
Archibald McClure,	Albany, N. Y.	“	1880
David J. Sewall,	Boston, Mass.	“	1875
William S. Sweet,	Warsaw, N. Y.	“	1882

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PREFACE.

It is well known that the remedies for which the Pharmacopœia prescribes definite standards, constitute only a limited portion of the resources of the medical profession in the treatment of the sick. Without referring to the more ephemeral preparations, or to such as are of a proprietary character, or are used by the public for self-medication, there is a large number of others, which are more or less frequently prescribed by physicians, or demanded by the public, but which are not recognized by the Pharmacopœia, either because they were not deemed by the revisers to be of sufficient importance to be included in the official work, or because they originated subsequently to the appearance of that work, or for other reasons. Owing to the absence of an authoritative standard, many of these unofficial preparations have been, and are being made, after different formulæ, and in varying strength, so that the pharmacists, particularly in the larger cities, are compelled to procure and keep on hand a variety of brands of what is intended to be one and the same preparation, to satisfy the demands of their patrons, professional or otherwise. The evils arising from this condition of things are so well known and so far-reaching in their results, that there is no need of any argument in favor of a plan which may palliate the existing evil, chiefly caused by a lack of uniformity, or the want of a common standard.

In order to bring about a practical amelioration of this state of things, a local Committee representing the College of Pharmacy of the City of New York, the Kings County Pharmaceutical Society of Brooklyn, and the German Apothecaries' Society of the City of New York, several years ago published a book of formulæ, comprising those which were in most frequent use in their immediate vicinity, and recommended the same to the medical profession. As this book appeared at a time which happened to be particularly favorable to the realization of the object sought to be attained, it gained so much ground, even outside of the locality for which it was originally intended, that the Joint Committee, authorized by the Societies which it represented, tendered the work to the American Pharmaceutical Association, at the Annual Meeting held at Pittsburgh, in 1885, as a nucleus for the construction of a National Formulary. The Association having accepted the gift, a Committee was appointed to prepare such a work, and as a first result, this Committee presented at the next Annual Meeting, held at Providence, in 1886, a "*Preliminary Draft of a National Formulary*," comprising whatever the Committee had been able to gather, either from existing formularies, or from its own labors, or from the special contributions of individuals or societies. This Draft showed, more forcibly than could have been done in any other manner, how serious the existing evil was, and at the same time, how difficult would be the task to bring into harmony the conflicting views and customs. For the purpose of enabling the Committee to accomplish this task with better expectation of success, it was enlarged by the addition of one member from every State Pharmaceutical Association in the United States and Canada.

The Committee thus constituted has endeavored, to the best of its ability, to carry out the object for which it was appointed. While it was, of course, impossible for most of the members representing other States, personally to attend the weekly meetings of the Committee, held in New York City, yet all important matters were referred to them by circular, and their votes thereon solicited, so that the results, regarded as a whole, truly represent the intentions and decisions of the whole Committee, though individual members may not have agreed upon every detail.

One of the most difficult problems which the Committee encountered, was the selection of the preparations which should be admitted into the Formulary. In order to ascertain the wishes of the different sections of the country, a printed list of the proposed titles was sent to each member, and a vote or expression of opinion thereon asked for. After all the votes had been returned, it was evident that much would still be left to the discretion of the Editing Sub-Committee, which had in the meantime been appointed. The latter, thereupon, prepared a final list of titles, which was again submitted to the members, and this list having been slightly amended in accordance with the suggestions received, was made the basis of the final text, though in the course of editing some further changes, chiefly additions, became necessary in order to fill in existing gaps. On looking over the contents of the book, every individual reader will probably encounter quite a number of preparations with which he is unfamiliar, or which he has never had occasion to use or to dispense, and the presence of which, from his standpoint, may appear superfluous. It should, however, be remembered that every section of this large country had to be considered; hence, what may be entirely unused or only rarely used in one section, may be of common occurrence in another. It is quite probable that some preparations which ought to have been received into the Formulary have been overlooked, or that some of those introduced are not as frequently employed as has been represented to the Committee. Whatever error may have been committed in one direction or another, will no doubt be corrected in subsequent editions.

While it was at no time contemplated by the Committee as a whole—though, perhaps, by some individual members—to devise imitations of any of the popular nostrums of the present day, yet it was very difficult to decide exactly where the line should be drawn. Consequently the list will be found to include a small number of formulæ which may recall some of the before-mentioned preparations, but which are constructed on rational principles, irrespective of mere external appearance and taste, and mainly with regard to uniform composition and reliable effect. It is not expected that these preparations will readily replace, in the eyes of the public, the much-advertised nostrums, but it is hoped that if proper therapeutic effects are expected from them, they will be used or directed to be used in place of the commercial articles, the composition of which is generally kept secret. A proposition was at one time made to include in the work definitions and descriptions of the more important crude drugs and chemicals which have come into use since the last U. S. Pharmacopœia was issued. But it was found that the labor involved in the task already outlined was so great, that no time could be devoted to any further additions. Hence the project had to be abandoned, though it will be a comparatively easy matter to incorporate these additions in a subsequent edition.

In constructing the formulæ of the compound preparations, it has been the endeavor of the Committee to make them as independent from each other as possible, so that only a comparatively small number of what may be called *basic preparations* need be kept in stock. The principal bases thus required are:

No. 25. Elixir Adjuvans. As a vehicle, chiefly for saline preparations.—No. 31. Aromatic Elixir. Intended to be used as a substitute for the officinal Elixir Aurantii, unless the latter or some other flavored Elixir should be preferred.—No. 42. Elixir of Cinchona.—No. 44. Detannated Elixir of Cinchona.—No. 54. Elixir of Yerba Santa.—No. 81. Elixir of Pepsin.—No. 105. Compound Elixir of Taraxacum.—No. 337. Aromatic Spirit.—No. 338. Compound Spirit of Orange.—No. 340. Spirit of Curaçao.—No. 352. Syrup of Coffee.—No. 360. Aromatic Syrup of Yerba Santa.—No. 394. Detannated Tincture of Cinchona.—If these are kept in stock in reasonable quantities, most of the compound preparations contained in the Formulary may be prepared in a short time.

Regarding the system of weights and measures used in the work, the probable action of the Committee had been foreshadowed in their last Report to the American Pharmaceutical Association, in which they expressed their conviction that all medicines that are prescribed by *measure*, had better be prepared by measure, or by weight *and* measure. The Committee is of the opinion that the working formulæ, either in a Pharmacopœia or in a Formulary, need not all be forced into one rigid, immutable, and uniform system of weights or of measures, but that a judicious and common-sense selection of one or another system, in different formulæ of the same work, may be perfectly legitimate, so long as those used in one and the same formula are practically commensurate with each other—the object, in all cases, being to obtain uniform and definite products, the relative strength of which will be immediately understood without special calculations. While, therefore, the system of *parts by weight* has been unreservedly admitted in the case of such preparations as are always, or at least preferably, made by weight (for instance, No. 2, Acidum Carbolicum Iodatum; No. 10, Boroglycerinum, etc., etc.), definite weights and measures have been used in the case of all those which are taken or administered by measure.

In the choice of the terms expressing the different denominations of weights and measures, some variation will be noticed, which is, however, introduced designedly. For instance, in No. 197 (Linimentum Opii Compositum), the first item is 1½ fluidounces; the second, 120 grains; the third, 4 fluidounces; the fourth, 180 minims; the fifth, 6 fluidounces, etc. The term "180 minims" was preferred to "3 fluidrachms," to break the monotony of the *fluid* terms, so as to diminish the risk of a mistake. And this method has been applied also in many other cases.

Regarding the nomenclature, the Committee has selected what appeared to them the most suitable and expressive titles. Probably many of the preparations in the work will never be ordered under their Latin names, as for instance, "Pulvis Hydrargyri Chloridi Mitis et Jalapæ" ("Calomel and Jalap"); yet it was deemed necessary to introduce such titles, in order to secure a homogeneous alphabetical arrangement.

In the selection of the particular process or working formula for each preparation, the Committee has proceeded with all the care that it was possible to bestow upon it. All suggestions, recommendations and criticisms were carefully and impartially considered, and, whenever possible, practically tested. It is not to be expected, however, that the Committee has always succeeded in making the best selection. Indeed, many of the formulæ will, no doubt, hereafter, require modification to make them more perfect, after a sufficient time has elapsed to fully test the merits of the different processes.

It was not within the province of the Committee to meddle with matters of which the medical practitioner or the therapeutist is the proper and competent judge. In most cases, it was sufficient to take a formula, just as it was already in existence, and to adopt it either entirely without change, or to restrict the modifications to the unessential features without affecting its therapeutic value, and merely with a view to improve its form. There are, however, a number of preparations in which more radical changes appeared desirable. In these cases the Committee availed itself of the advice of competent medical authorities, either by personal interviews or by correspondence.

The mission which this work is to fulfil can only be properly accomplished by the co-operation of the medical profession. It is, therefore, of the greatest importance that the members of this profession, throughout the country, be made acquainted with the existence, contents and objects of this book, and that, if the same be approved by them, as is confidently expected, they will consent to accept the preparations made in accordance with the formulæ contained therein, instead of designating any special maker's product.

In the execution of its task, the National Committee has been fortunate enough to avail itself of valuable advice and assistance, both voluntary and solicited, from many members of the profession and other sources. At the request of the Committee, the three Societies who had issued the pamphlet above spoken of, continued the several committees formerly appointed by them, and this increase of the working nucleus of the National Committee has been of the utmost importance to a successful termination of its allotted task, since without this assistance, it would have been physically impossible for it to perform the large number of experiments, and to prepare the many hundreds of specimens, necessary to decide on the merits of the various proposed formulæ. The gentlemen who have so generously assisted the Committee, and to whom special thanks are due, are: Messrs. Gustavus Balser, Julius Kalish, Edward L. Milhau, and Henry Schmid, from the College of Pharmacy of the City of New York; Messrs. Donald L. Cameron, Thomas D. McElhenie, J. P. Heyen, Louis E. Nicot, and Charles R. Paddock, of the Kings County Pharmaceutical Society; and Messrs. Theodore Louis, Charles E. P. Meumann, Gustavus Pfingsten, Gustavus Ramsperger, and Charles F. Schleussner, of the German Apothecaries' Society of the City of New York. Very valuable assistance has also been rendered to the Committee by the following gentlemen: Prof. Joseph P. Remington, Prof. J. M. Maisch, and Mr. Alfred B. Taylor of Philadelphia, Prof. J. U. Lloyd of Cincinnati, Dr. Robert G. Eccles of Brooklyn, Prof. Charles E. Munroe, U. S. N., of Newport,

R. I., Prof. Alfred M. Mayer of Hoboken, N. J., Messrs. Charles F. Heebner, W. M. Massey, and B. T. Fairchild of New York, Mr. O. A. A. Rouillion of Brooklyn, Mr. C. H. Bernhard of Madison, and Mr. A. Conrath of Milwaukee, Wis., Dr. Charles Mohr of Mobile, Ala., Mr. J. H. Dawson, and Prof. W. T. Wenzell of San Francisco, Messrs. R. B. Ferguson, W. S. Thompson, and G. G. C. Simms of Washington, D. C., Dr. A. B. Lyons of Detroit, Mich., Messrs. S. A. D. Sheppard, and J. W. Colcord of Boston, Mass., Mr. J. D. A. Hartz of College Point, N. Y., Mr. Albert E. Ebert, Prof. E. B. Stuart and Mr. Charles L. Feldkamp of Chicago, Ill., the Committees on Unofficinal Formulæ appointed by various State Pharmaceutical Associations during the last two years, and many others.

The Committee, on behalf of the American Pharmaceutical Association, now turns over its work to the public, and expresses the hope that it will be accepted as a standard and guide, whenever possible. In order that it may be rendered more perfect and complete, it is respectfully urged that any defects, omissions, or errors, be carefully noted, and that a list of these, as well as suggestions and propositions for a future revision, be sent to the Secretary of the American Pharmaceutical Association, or to any Formulary Committee that may hereafter be appointed.

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ERRATA.

PAGE

8—Form. 22. Cordiale Rubi Fructus is preferably prepared thus: "Percolate the powdered spices with Diluted Alcohol to obtain *two* (2) *pints* of tincture, and add to this the *three* (3) *pints* of Blackberry Juice. Then add *one hundred and twenty* (120) *grains* of Purified Talcum, set the mixture aside for twelve hours, or longer, if convenient, occasionally shaking, and filter. To the filtrate add the Syrup."

18—Form. 51. At the end of the note printed in italics read: "*and 1 grain of Pepsin* (*N. F.*)"

28—Form. 83. Read: "Syrup . . 3 fluidounces," instead of "4 fluidounces."

48—Form. 133. Read: "Menstruum I: Alcohol 9 fluidounces, Water 5 fluidounces, Glycerin 2 fluidounces. Menstruum II: Alcohol 9 fluidounces, Water, 7 fluidounces."

58—Form. 178. Read: "Sugar, in very fine powder, . . 640 parts."

81—Form. 235. At the end of the directions add: "Finally filter."

Form. 237. Read: "add the Bicarbonate of Sodium in divided portions."

84—Form. 244. Add the synonym: *Lotio Hydrargyri Flava* (Brit. Pharm.).

Form. 245. Add the synonym: *Lotio Hydrargyri Nigra* (Brit. Pharm.).

97—Form. 278. Read: "then transfer the mass to a strainer of Canton flannel, and add to the filtrate an equal volume of Alcohol. Collect the precipitate, drain it, and free it by pressure from as much of the adherent liquid as possible. Then spread it on shallow trays, and dry it by exposure to warm air, at a temperature not exceeding 40° C. (104° F.). Triturate the dry product, in a mortar, with *four* (4) *times* its weight of pure benzin; transfer the mass to a dry filter, and when the liquid has passed below the surface of the powder, follow it with enough fresh benzin to displace the retained portion. Lastly dry the powder between bibulous paper."

98—Form. 279. Line 6 from below, read: "should remain" for "may remain."

112—Form. 322 II. Read: "but so that it will retain its crystalline character."

Form. 323. Read: "Sugar, in very fine powder . . 290 parts."

130—Form. 368. Lines 17 and 16 from below, read: "replacing from time to time any Water lost by evaporation, and cautiously adding small portions of the Soda solution, until the magma is entirely dissolved."

139—Form. 389. In the note printed in italics, read: "*contains about ⅓ grain.*"

148—Form. 411. The words in the text "cut into thin slices and carefully freed from any adhering fine powder" apply to the Rhubarb, *before* it is weighed.

154—Form. 428. Among the ingredients insert "Syrup . . 1½ fluidounces." In the text read: "then gradually add, while stirring, the Syrup, previously mixed with *ten* (10) *fluidounces* of Angelica Wine, and afterwards the Tincture of Citro-Chloride of Iron."

A few discrepancies in nomenclature were noticed too late to be corrected, such as: Form. 21, "Indian Hemp," for "Indian Cannabis." Form. 23 and 70, "Extract of Liquorice," for "Extract of Glycyrrhiza;" Form. 359 and elsewhere, "Irish Moss" for "Chondrus." Form. 258 and 389, "Resin of Guaiac," for "Guaiac."—Form. 351. "Syrupus Actææ Compositus," should have been made a synonym, and the chief title should be "Syrupus Cimicifugæ Compositus."

THE

NATIONAL FORMULARY

OF

UNOFFICINAL PREPARATIONS.

OFFICINAL STANDARDS.

All ingredients entering into the formulas contained in this work, and which are officinal in the U. S. Pharmacopœia of 1880, are intended to comply with the requirements of that authority, unless otherwise directed. In some cases, particular attention has been drawn to this, by placing after the name of the ingredient the abbreviation "(U. S. P.)," or "(U. S. P. 1880)."

PARTS BY WEIGHT.

Whenever the quantities of the ingredients of a formula are given in *parts*, this is to be always understood as meaning *parts by weight*.

ABBREVIATIONS.

U. S. P. = United States Pharmacopœia.
N. F. = National Formulary.

NATIONAL FORMULARY

OF

UNOFFICINAL PREPARATIONS.

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1. ACETUM AROMATICUM.

Aromatic Vinegar.

Oil of Lavender	4 minims.
Oil of Rosemary	4 "
Oil of Juniper	4 "
Oil of Peppermint	4 "
Oil of Cinnamon (Cassia)	4 "
Oil of Lemon	8 "
Oil of Cloves	8 "
Alcohol	3 fluidounces.
Acetic Acid (U. S. P.)	3 "
Water . . . enough to make	16 "

Dissolve the Oils in the Alcohol, add the Acetic Acid, and lastly, enough Water to make *sixteen* (16) *fluidounces.* Warm the turbid mixture, during several hours, at a temperature not exceeding 70° C. (158° F.), taking care that it shall not suffer loss by evaporation. Then set it aside for a few days, occasionally agitating, and filter.

2. ACIDUM CARBOLICUM IODATUM.

Iodized Carbolic Acid.

Phenol Iodatum. Iodized Phenol.

Iodine, reduced to powder	20 parts.
Carbolic Acid	76 "
Glycerin	4 "

Introduce the Iodine into a flask, add the Carbolic Acid, previously melted, and the Glycerin, and digest the mixture at a gentle heat, frequently agitating, until the Iodine is dissolved.

Keep the product in glass-stoppered vials, in a dark place.

3. ACIDUM HYPOPHOSPHOROSUM DILUTUM.

Diluted Hypophosphorous Acid.

Hypophosphite of Potassium	208 parts.
Tartaric Acid	300 "
Distilled Water	588 "
Diluted Alcohol	600 "

Dissolve the Hypophosphite of Potassium in the Distilled Water, and the Tartaric Acid in the Diluted Alcohol. Mix the two solutions in a flask, cork the latter well, and put it aside in a cold place during twelve hours. Then carefully decant the liquid into a funnel, the neck of which contains a pellet of absorbent cotton, or, if necessary, pass the liquid through a filter, care being taken that it shall not suffer loss by evaporation. Weigh the filtrate, which contains *ten* (10) *per cent.* of hypophosphorous acid, in a tared capsule, and evaporate the alcohol by means of a water-bath, at a temperature not exceeding 60° C. (140° F.). Then allow the liquid to cool, and add enough Distilled Water to restore the original weight of the filtrate. Preserve the product in well-stoppered bottles.

Hypophosphorous Acid thus prepared contains 10 per cent. of absolute hypophosphorous acid (H_3PO_2), and has a specific gravity of 1.060 at 15° C. (59° F.) If the acid is required for immediate use, and the presence of alcohol is not objectionable, the mixture of the two solutions need be cooled only a short time, and the filtrate may be used at once. If a 50 per cent. acid is required, the concentration may be cautiously continued until the desired percentage has been attained. A 50 per cent. acid has a specific gravity of about 1.406 at 15° C. (59° F.)

4. ACIDUM METAPHOSPHORICUM DILUTUM.

Diluted Metaphosphoric Acid.

Acidum Phosphoricum Glaciale Dilutum. Diluted Glacial Phosphoric Acid.

Glacial Phosphoric Acid	780 grains.
Distilled Water	enough to make 16 fluidounces.

Dissolve the Acid in the Water, without heat.

This preparation should be kept in a cool and dark place, and should not be prepared in larger quantity than may be consumed within a few months.

Note.—The resulting product contains about 10 per cent. of metaphosphoric acid, provided the glacial acid was free from impurities. That which is sold in form of glassy lumps is usually of sufficient purity. The variety in form of round sticks is more or less impure, containing generally more than 15 per cent. of phosphate of sodium. If this variety is alone available, a proportionately larger quantity must be taken, to be determined, if time permits, by an assay of the free acid present. If no special accuracy is required, about 900 grains of this variety of the acid may be reckoned to be equivalent to the quantity directed in the above given formula.

Whenever Pyrophosphate of Iron (U. S. P.) forms one of the ingredients of a mixture containing Diluted Phosphoric Acid, the officinal tribasic acid is unsuitable, as it produces with the salt a gelatinous precipitate. If a clear mixture is required, the above preparation is to be used in place of the officinal. The same may be done when Phosphate of Iron (U. S. P.) is prescribed, though the precipitate caused by the officinal acid in this case is not as bulky, and under certain conditions may not form at all.

5. AQUA CHLOROFORMI.

Chloroform Water.

Purified Chloroform	30 minims.
Distilled Water	10 fluidounces.

Shake them together in a capacious bottle, until the Chloroform is dissolved, or until only a small quantity remains which cannot be dissolved by further agitation. Then filter in a covered funnel. Keep the product in well-stoppered bottles.

Note.—Chloroform water, aside from its medicinal properties, is an efficient preservative agent, and forms a good solvent, in place of water, for preparing solutions which require to be kept free from micro-organisms.

6. AQUA HAMAMELIDIS.

Hamamelis Water.

Witchhazel Water. Witchhazel Extract.

Hamamelis, shoots and twigs	10 pounds.
Water	20 pints.
Alcohol	1½ "

Place the Hamamelis in a still, add the Water and Alcohol, and allow the mixture to macerate during twenty-four hours. Distil *ten* (10) *pints* by applying direct heat, or preferably, by means of steam.

Note.—This preparation should be made only from the fresh young twigs of Hamamelis, which are collected for this purpose preferably, when the plant is in flower, in the late autumn of the year.

7. AQUA SEDATIVA.

Sedative Water.

Lotio Ammoniacalis Camphorata (Codex). *Eau Sédative de Raspail.*

Water of Ammonia	2 fluidounces.
Spirit of Camphor	90 minims.
Chloride of Sodium	1 troy ounce.
Water	enough to make 16 fluidounces.

Dissolve the Chloride of Sodium in about *eight* (8) *fluidounces* of Water, add the Water of Ammonia and Spirit of Camphor, and finally enough Water to make *sixteen* (16) *fluidounces.*

Shake the liquid when it is to be dispensed.

8. BALSAMUM TRAUMATICUM.

Traumatic Balsam.

Turlington's Balsam. Friar's Balsam.

Benzoin, in coarse powder	1½ troy ounces.
Storax	½ troy ounce.
Balsam of Tolu	½ " "
Balsam of Peru	120 grains.
Aloes, in coarse powder	60 "
Myrrh, in coarse powder	60 "
Angelica Root, in moderately coarse powder	30 "
Alcohol	16 fluidounces.

Macerate the substances with the Alcohol during ten days, frequently agitating; then filter.

Note.—The officinal *Tinctura Benzoini Composita* is a simplified preparation intended to replace the above compound.

9. BISMUTHI OXIDUM HYDRATUM.

Hydrated Oxide of Bismuth.

Subnitrate of Bismuth	6 troy ounces.
Nitric Acid	10 " "
Water of Ammonia	12 " "
Bicarbonate of Sodium	1 troy ounce.
Distilled Water	a sufficient quantity.

Mix the Subnitrate of Bismuth with *four* (4) *fluidounces* of Distilled Water in a quart flask, add *nine* (9) *troy ounces* of Nitric Acid, and promote the solution of the salt by agitation, and, if necessary, by a gentle heat. Pour the solution into *one* (1) *gallon* of Distilled Water previously acidulated with *one* (1) *troy ounce* of Nitric Acid, and filter the liquid through absorbent cotton. Mix the Water of Ammonia with *two* (2) *gallons* of Distilled Water in a glazed vessel of double that capacity, and pour into it, slowly and with constant stirring, the bismuth solution. Let the mixture stand during four hours so that the precipitate may subside, then pour off the supernatant liquid, and wash the precipitate four times more by decantation with Distilled Water, the Bicarbonate of Sodium being dissolved in the last wash-water. Pour the precipitate upon a wetted muslin strainer, and wash it with Distilled Water, until the washings run off tasteless. Transfer the strainer to a warm place, so that the precipitate may dry. Then rub the latter to powder, and keep it in well-stoppered bottles.

Note.—Hydrated Oxide of Bismuth is sometimes demanded in the form of a creamy mixture with water, under the name of *Cremor Bismuthi* or *Cream of Bismuth.* This may be prepared by triturating 20 parts of the Oxide with 80 parts of Water.

10. BOROGLYCERINUM.

Boroglycerin.

Glyceryl Borate. Boroglyceride.

Boric Acid, in powder	62 parts.
Glycerin	92 "

Heat the Glycerin in a tared porcelain capsule to a temperature not exceeding 150° C. (302° F.), and add the Boric Acid in portions, constantly stirring. When all is added and dissolved, continue the heat at the same temperature, frequently stirring, and breaking up the film which forms on the surface. When the mixture has become reduced to a weight of *one hundred* (100) *parts*, pour it out on a flat surface previously coated with a very small quantity of petrolatum, let it cool, cut it into pieces and transfer them immediately to bottles or jars, which should be well stoppered.

Note.—When a solution of Boroglycerin is required, it is preferable to prescribe, or to dispense the Glycerite of Boroglycerin (see *Glyceritum Boroglycerini*).

11. CAFFEINÆ CITRAS EFFERVESCENS.

Effervescent Citrate of Caffeine.

Caffeine	20 parts.
Citric Acid	20 "
Bicarbonate of Sodium	600 "
Tartaric Acid	540 "
Sugar, in very fine powder	620 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of the above compound represent 1 grain of Caffeine.

12. CAFFEINÆ SODIO-BENZOAS.

Sodio-Benzoate of Caffeine.

Caffeine	50 parts.
Benzoate of Sodium	50 "
Alcohol	a sufficient quantity.

Triturate the Caffeine with the Benzoate of Sodium and a sufficient quantity of Alcohol to a smooth paste, and dry this by exposure in a moderately warm place. Rub the dry mass to powder, and keep it in well-stoppered bottles.

Note.—The product contains 50 per cent. of Caffeine, and is soluble in 2 parts of water.

13. CAFFEINÆ SODIO-SALICYLAS.

Sodio-Salicylate of Caffeine.

Caffeine	50 parts.
Salicylate of Sodium	50 “
Alcohol	a sufficient quantity.

Triturate the Caffeine with the Salicylate of Sodium and a sufficient quantity of Alcohol to a smooth paste, and dry this by exposure in a moderately warm place. Rub the dry mass to powder, and keep it in well-stoppered bottles.

Note.—The product contains 50 per cent. of Caffeine and is soluble in 2 parts of water.

14. CARBASUS CARBOLATA.

Carbolized Gauze.

Resin, in coarse powder	40 parts.
Castor Oil	5 “
Carbolic Acid	10 “
Alcohol	225 “
Gauze Muslin	a sufficient quantity.

Dissolve the Resin, Castor Oil and Carbolic Acid in the Alcohol. Then immerse in the mixture loosely-folded pieces of gauze muslin, allow them to become thoroughly saturated, then take them out and press out the excess of liquid, until the weight of the impregnated Gauze amounts to *one hundred and seventy* (170) *parts*, for every *one hundred* (100) *parts* of the original fabric. Spread out the pieces horizontally, and as soon as the Alcohol has nearly all evaporated, fold and wrap the pieces in paraffin paper, and preserve them in air-tight receptacles.

The impregnated Gauze, when dry, contains about 2.5 per cent. of Carbolic Acid.

Note.—The most suitable brands of gauze muslin for making carbolized or other antiseptic gauze, are those known in the market as "Stillwater," or "Lehigh E."

15. CARBASUS IODOFORMATA.

Iodoform Gauze.

Iodoform	10 parts.
Stronger Ether	40 “
Alcohol	40 “
Tincture of Benzoin	5 “
Glycerin	5 “
Gauze Muslin	a sufficient quantity.

Dissolve the Iodoform in the Stronger Ether, then add the Alcohol, Tincture of Benzoin, and Glycerin. Immerse in a weighed quantity of this solution, contained in a suitable vessel, the exact amount of Gauze Muslin required to absorb the whole of it, to produce a product of a prescribed percentage of iodoform, work it about with a pestle so as to impregnate it uniformly; then take it out, and hang it up to dry, in a horizontal position, and in a dark place. Lastly, wrap it in paraffin paper and preserve it in air-tight receptacles.

Note.—To calculate the amount of muslin and of iodoform solution required to obtain a product approximately of any required percentage of iodoform, let x denote this required percentage. Then take of the above Iodoform Solution *ten* (10) *times* this quantity (or 10 x). Also multiply the required percentage (x) by *three* (3), divide the resulting product by *two* (2), and subtract the quotient from *one hundred* (100). The remainder represents the number of parts by weight of Gauze Muslin to be used. Regarding the most suitable kind of Gauze Muslin, see note to *Carbasus Carbolata*.

16. CERATUM CAMPHORÆ COMPOSITUM.

Compound Camphor Cerate.

Ceratum Camphoratum. Camphor Ice.

Camphor, in coarse powder	1½ troy ounces.
White Wax	2 " "
Castor Oil	4 " "
Spermaceti	7 " "
Carbolic Acid, liquefied by warming	10 minims.
Oil of Bitter Almond	6 minims.
Benzoic Acid	60 grains.

Melt the White Wax and Spermaceti on a water-bath, add the Castor Oil, and afterwards the Camphor, and continue heating and stirring until the Camphor is dissolved. Then withdraw the heat, cover the vessel, and when the mixture has somewhat cooled, add the remaining ingredients, and thoroughly incorporate them by stirring. Lastly, pour the Cerate into suitable moulds.

17. CHLORAL CAMPHORATUM.

Camphorated Chloral.

Chloral et Camphora. Chloral and Camphor.

Chloral	50 parts.
Camphor	50 "

Mix them by agitation in a bottle, or by trituration in a warm mortar, until they are liquefied and combined.

18. COLLODIUM IODATUM.

Iodized Collodion.

Iodine, reduced to powder	5 parts.
Flexible Collodion	95 "

Introduce the Iodine into a bottle, add the Flexible Collodion and agitate until the Iodine is dissolved.

19. COLLODIUM IODOFORMATUM.

Iodoform Collodion.

Iodoform	5 parts.
Flexible Collodion	95 “

Dissolve the Iodoform in the Flexible Collodion by agitation.

20. COLLODIUM TIGLII.

Croton Oil Collodion.

Croton Oil	10 parts.
Flexible Collodion	90 “

Mix them.

21. COLLODIUM SALICYLATUM COMPOSITUM.

Compound Salicylated Collodion.

Corn Collodion.

Salicylic Acid	11 parts.
Extract of Indian Hemp	2 “
Alcohol	10 “
Flexible Collodion	enough to make 100 parts.

Dissolve the Extract of Indian Hemp in the Alcohol, and the Salicylic Acid in about *fifty* (50) *parts* of Flexible Collodion contained in a tared bottle. Then add the former solution to the latter, and finally add enough Flexible Collodion to make *one hundred* (100) *parts*.

22. CORDIALE RUBI FRUCTUS.

Blackberry Cordial.

Blackberry Juice	3 pints.
Cinnamon, in coarse powder	2 troy ounces.
Cloves, in coarse powder	½ troy ounce.
Nutmeg, in coarse powder	½ “ “
Diluted Alcohol	2 pints.
Syrup	3 “

Digest the Spices with the Diluted Alcohol for eight days; then mix with the Blackberry Juice and strain; lastly, add the Syrup.

23. DECOCTUM ALOES COMPOSITUM.

Compound Decoction of Aloes.

Aqueous Extract of Aloes	120 grains.
Myrrh	90 “
Saffron	90 “
Carbonate of Potassium	60 “
Extract of Glycyrrhiza, in powder	1 troy ounce.
Compound Tincture of Cardamom	8 fluidounces.
Water	enough to make 30 “

Reduce the Myrrh and Extract of Aloes to a coarse powder, mix this with the Carbonate of Potassium and Extract of Liquorice in a suitable covered vessel, and pour on *twenty* (20) *fluidounces* of Water; boil for five minutes, and add the Saffron. When cool, add the Compound Tincture of Cardamom, and allow the mixture to macerate for two hours; then filter through flannel, and add enough Water to make the product measure *thirty* (30) *fluidounces.*

This preparation should be freshly made when wanted for use.

24. ELIXIR ACIDI SALICYLICI.

Elixir of Salicylic Acid.

Salicylic Acid	640 grains.
Citrate of Potassium	2 troy ounces.
Glycerin	8 fluidounces.
Aromatic Elixir . . . enough to make	16 "

Dissolve the Citrate of Potassium in the Glycerin with the aid of a gentle heat. Add the Salicylic Acid, and continue the heat until it is dissolved. Then add enough Aromatic Elixir to make *sixteen* (16) *fluidounces.*

This Elixir should be freshly made when wanted for use.

Each fluidrachm contains 5 grains of Salicylic Acid.

25. ELIXIR ADJUVANS.

Adjuvant Elixir.

Sweet Orange Peel, recently dried	2 troy ounces.
Wild Cherry	4 " "
Glycyrrhiza, Russian, peeled	8 " "
Coriander	1 troy ounce.
Caraway	1 " "
Alcohol, **Water**	each, a sufficient quantity.
Syrup . . . enough to make	1 gallon.

Grind the Wild Cherry to a moderately coarse (No. 40) powder, moisten it with *four* (4) *fluidounces* of Water and set it aside for twelve hours. Reduce the other solids also to a moderately coarse (No. 40) powder, mix this intimately with the Wild Cherry, and having mixed *one* (1) *volume* of Alcohol with *two* (2) *volumes* of Water, moisten the powder with *four* (4) *fluidounces* of the mixture, and pack tightly in a percolator. Then gradually pour menstruum on top until *ninety-six* (96) *fluidounces* of percolate are obtained. Mix this with *thirty-two* (32) *fluidounces* of Syrup, and filter.

Note.—This preparation is chiefly intended as a vehicle, particularly for acrid or saline remedies.

26. ELIXIR AMMONII BROMIDI.

Elixir of Bromide of Ammonium.

Bromide of Ammonium	640 grains.
Citric Acid	30 "
Adjuvant Elixir	enough to make 16 fluidounces.

Dissolve the Bromide of Ammonium and the Citric Acid in about *eight* (8) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter, if necessary.

Each fluidrachm contains 5 grains of Bromide of Ammonium.

27. ELIXIR AMMONII VALERIANATIS.

Elixir of Valerianate of Ammonium.

Valerianate of Ammonium	256 grains.
Water of Ammonia	a sufficient quantity.
Chloroform	6 minims.
Tincture of Vanilla	120 "
Compound Tincture of Cudbear	120 "
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Valerianate of Ammonium in about *twelve* (12) *fluidounces* of Aromatic Elixir, in a graduated vessel, and add enough Water of Ammonia, in drops, until a faint excess of it is perceptible in the liquid. Then add the Chloroform, Tincture of Vanilla and Compound Tincture of Cudbear, and finally, enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Filter, if necessary.

Each fluidrachm contains 2 grains of Valerianate of Ammonium.

Note.—Should the odor of valerianic acid become perceptible after the Elixir has been kept for some time, it may be overcome by slightly supersaturating with Water of Ammonia.

28. ELIXIR AMMONII VALERIANATIS ET QUININAE.

Elixir of Valerianate of Ammonium and of Quinine.

Hydrochlorate of Quinine	32 grains.
Elixir of Valerianate of Ammonium	16 fluidounces.

Dissolve the Hydrochlorate of Quinine in the Elixir by agitation, and, if necessary, by occasionally immersing the bottle containing the ingredients in hot water, until solution has been effected. Finally filter.

Each fluidrachm contains ¼ grain of Hydrochlorate of Quinine and 2 grains of Valerianate of Ammonium.

29. ELIXIR ANISI.

Elixir of Anise.

Aniseed Cordial.

Anethol	25 minims.
Oil of Fennel	5 "
Oil of Bitter Almond	1 drop.
Deodorized Alcohol	4 fluidounces.
Syrup	10 "
Water	2 "
Purified Talcum	120 grains.

Mix the Anethol and the Oils with the Deodorized Alcohol, add the Syrup and Water, and set the mixture aside for twelve hours. Then mix it intimately with the Purified Talcum, and filter it through a wetted filter, returning the first portions of the filtrate until it runs through clear.

Note.—This Elixir is liable to become cloudy, from separation of essential oils, when it is exposed to a temperature lower than that at which it has been filtered. In general, it is recommended that it be cooled to, and filtered at a temperature of about 15° C. (59° F.). In the northern sections of this country, or in winter time, it should be cooled to a proportionately lower temperature, previous to filtration.

Anethol is the stearopten of oil of anise, and possesses a finer and purer aroma and taste than any commercial variety of oil of anise. If it cannot be readily obtained, the so-called Saxon oil of anise may be substituted for it. Oil of star-anise which is usually supplied by dealers when "oil of anise" without specification is ordered, does not answer well for this purpose. The oil of fennel should be that from the seed ("sweet"), and not that from the chaff.

30. ELIXIR APII GRAVEOLENTIS COMPOSITUM.

Compound Elixir of Celery.

Fluid Extract of Celery Root	1 fluidounce.
Fluid Extract of Erythroxylon	1 "
Fluid Extract of Kola	1 "
Fluid Extract of Viburnum Prunifolium	1 "
Alcohol	2 fluidounces.
Aromatic Elixir . . . . enough to make	16 "

Mix the Alcohol with *four* (4) *fluidounces* of Aromatic Elixir. To this add the Fluid Extract of Celery Root in several portions, shaking after each addition, and afterwards the other Fluid Extracts. Finally add enough Aromatic Elixir to make *sixteen* (16) *fluidounces;* allow the mixture to stand twenty-four hours, and filter.

Note.—If this preparation is prescribed or quoted under its Latin title, it is recommended that the full title be given, so that the word "Apii" may not be mistaken for "Opii."

31. ELIXIR AROMATICUM.

Aromatic Elixir.

Aromatic Spirit	16 fluidounces.
Syrup	24 "
Water	24 "
Purified Talcum	1 troy ounce.

Mix the Aromatic Spirit with *twelve* (12) *fluidounces* of Syrup, and add the Water. Incorporate the Purified Talcum thoroughly with the mixture, set the latter aside during a few days, if possible, occasionally agitating, then stir it well, and filter it through a wetted filter, returning the first portions of the filtrate until it runs through clear. Finally mix the filtrate with the remainder of the Syrup.

Note.—When this Elixir is to be used in preparations containing *iron*, the Aromatic Spirit to be used in its preparation should be that made from the essential oils (see *Spiritus Aromaticus*).

If it is desired to color this Elixir, this may be effected by the addition of *two* (2) *fluidrachms* of Compound Tincture of Cudbear to each pint.

32. ELIXIR BISMUTHI.

Elixir of Bismuth.

Citrate of Bismuth and Ammonium	256 grains.
Water, hot	1 fluidounce.
Water of Ammonia	a sufficient quantity.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Citrate of Bismuth and Ammonium in the hot Water, allow the solution to stand until any undissolved matter has subsided; then decant the clear liquid, and add to the residue just enough Water of Ammonia to dissolve it. Then mix it with the decanted portion and add enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm represents 2 grains of Citrate of Bismuth and Ammonium.

33. ELIXIR BUCHU.

Elixir of Buchu.

Fluid Extract of Buchu	2 fluidounces.
Alcohol	1 fluidounce.
Syrup	1 "
Purified Talcum	120 grains.
Adjuvant Elixir	enough to make 16 fluidounces.

Mix the Fluid Extract of Buchu with the Alcohol, then add *twelve* (12) *fluidounces* of Adjuvant Elixir, and the Syrup. Incorporate with it the Purified Talcum, and filter. Finally, pass enough Adjuvant Elixir through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents about 7½ grains of Buchu.

34. ELIXIR BUCHU COMPOSITUM.

Compound Elixir of Buchu.

Compound Fluid Extract of Buchu	4 fluidounces.
Alcohol	1 fluidounce.
Syrup	1 “
Purified Talcum	120 grains.
Adjuvant Elixir	enough to make 16 fluidounces.

Mix the Compound Fluid Extract of Buchu with the Alcohol, then add *eight* (8) *fluidounces* of Adjuvant Elixir, and the Syrup. Incorporate with it the Purified Talcum, and filter. Finally, pass enough Adjuvant Elixir through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 15 minims of Compound Fluid Extract of Buchu.

35. ELIXIR BUCHU ET POTASSII ACETATIS.

Elixir of Buchu and Acetate of Potassium.

Acetate of Potassium	640 grains.
Elixir of Buchu	enough to make 16 fluidounces.

Dissolve the Acetate of Potassium in about *twelve* (12) *fluidounces* of Elixir of Buchu, filter, if necessary, and add enough Elixir of Buchu to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 5 grains of Acetate of Potassium and about 7 grains of Buchu.

36. ELIXIR CAFFEINÆ.

Elixir of Caffeine.

Caffeine	128 grains.
Diluted Hydrobromic Acid (U. S. P.)	32 “
Syrup of Coffee	4 fluidounces.
Aromatic Elixir	enough to make 16 “

Rub the Caffeine, in a mortar, with the Diluted Hydrobromic Acid and about *two* (2) *fluidounces* of Aromatic Elixir, until solution is effected. Then add the Syrup of Coffee, and lastly, enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm contains 1 grain of Caffeine.

37. ELIXIR CALCII BROMIDI.

Elixir of Bromide of Calcium.

Bromide of Calcium	640 grains.
Citric Acid	30 “
Adjuvant Elixir	enough to make 16 fluidounces.

Dissolve the Bromide of Calcium and the Citric Acid in about *twelve* (12) *fluidounces* of Adjuvant Elixir by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter, if necessary.

Each fluidrachm contains 5 grains of Bromide of Calcium.

38. ELIXIR CALCII HYPOPHOSPHITIS.

Elixir of Hypophosphite of Calcium.

Hypophosphite of Calcium	256 grains.
Citric Acid	30 “
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Hypophosphite of Calcium in *fourteen* (14) *fluidounces* of Aromatic Elixir, and filter. Dissolve the Citric Acid in the filtrate and pass enough Aromatic Elixir through the filter to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains 2 grains of Hypophosphite of Calcium.

39. ELIXIR CALCII LACTOPHOSPHATIS.

Elixir of Lactophosphate of Calcium.

Lactate of Calcium	128 grains.
Phosphoric Acid (U. S. P. 50%)	128 minims.
Water	1 fluidounce.
Syrup	1 “
Aromatic Elixir	enough to make 16 fluidounces.

Triturate the Lactate of Calcium with the Phosphoric Acid, the Water, and the Syrup, until the salt is dissolved. Then add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm represents 1 grain of Lactate of Calcium, or about 1½ grains of so-called Lactophosphate of Calcium.

40. ELIXIR CATHARTICUM COMPOSITUM.

Compound Cathartic Elixir.

Fluid Extract of Senna	2 fluidounces.
Fluid Extract of Podophyllum	1 fluidounce.
Fluid Extract of Leptandra	360 minims.
Fluid Extract of Jalap	360 “
Tartrate of Potassium and Sodium	2 troy ounces.
Bicarbonate of Sodium	120 grains.
Compound Elixir of Taraxacum	4 fluidounces.
Elixir of Glycyrrhiza	enough to make 16 “

Mix the liquids, add the salts, and dissolve them by agitation.

The product should not be filtered, and should be shaken up whenever any of it is dispensed.

The average dose for an adult is 2 fluidrachms.

41. ELIXIR CHLOROFORMI COMPOSITUM.

Compound Elixir of Chloroform.

Chloroform		3 fluidounces.
Tincture of Opium		3 "
Spirit of Camphor		3 "
Aromatic Spirit of Ammonia		3 "
Alcohol		3 "
Oil of Cinnamon (Cassia)		40 minims.
Water	enough to make	16 fluidounces.

Mix the Chloroform with the Alcohol, then add the Oil of Cinnamon, Aromatic Spirit of Ammonia, Spirit of Camphor, Tincture of Opium, and lastly, enough Water to make *sixteen* (16) *fluidounces.* Allow the mixture to stand a few hours, and filter in a well-covered funnel.

Each fluidrachm represents about 1 grain of Opium and 11 minims of Chloroform.

Note.—This preparation is called Chloroform Paregoric in some sections of the country. It is recommended that this title be abandoned, to prevent confusion with the officinal Paregoric or *Tinctura Opii Camphorata.*

42. ELIXIR CINCHONÆ.

Elixir of Cinchona.

Elixir of Calisaya.

Tincture of Cinchona (U. S. P. 1880)		2½ fluidounces.
Aromatic Spirit		2 "
Syrup		6 "
Purified Talcum		120 grains.
Water	enough to make	16 fluidounces.

Mix the liquids, allow the mixture to stand for twenty-four hours or longer if convenient, then incorporate the Purified Talcum, and filter through a wetted filter, returning the first portions of the filtrate, until it runs through clear.

Each fluidounce represents about 14 grains of Yellow Cinchona.

Note.—When Elixir of Cinchona is directed in combination with preparations of iron, the *Elixir Cinchonæ Detannatum* should be used in place of the above preparation.

43. ELIXIR CINCHONÆ ET HYPOPHOSPHITUM.

Elixir of Cinchona and Hypophosphites.

Elixir of Calisaya and Hypophosphites.

Hypophosphite of Calcium		128 grains.
Hypophosphite of Sodium		128 "
Citric Acid		30 "
Water		2 fluidounces.
Elixir of Cinchona	enough to make	16 "

Dissolve the Hypophosphites and the Citric Acid in the Water, add enough Elixir of Cinchona to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 1 grain, each, of the Hypophosphites of Calcium and Sodium.

44. ELIXIR CINCHONÆ DETANNATUM.

Detannated Elixir of Cinchona.

Detannated Elixir of Calisaya.

Detannated Tincture of Cinchona	2½ fluidounces.
Aromatic Spirit	2 "
Syrup	6 "
Purified Talcum	120 grains.
Water	enough to make 16 fluidounces.

Mix the liquids, allow the mixture to stand twenty-four hours or longer if convenient, then incorporate the Purified Talcum, and filter through a wetted filter, returning the first portions of the filtrate, until it runs through clear.

Each fluidounce represents about 14 grains of Yellow Cinchona.

Note.—This preparation is to be used, when *Elixir Cinchonæ* is directed in combination with preparations of *iron.*

When Detannated Elixir of Cinchona is not available, and the preparation, of which it forms a constituent, is required at once, an equivalent quantity of Compound Elixir of Quinine, colored by the addition of 120 minims of Compound Tincture of Cudbear to each pint, may be substituted for it.

45. ELIXIR CINCHONÆ ET FERRI.

Elixir of Cinchona and Iron.

Elixir of Calisaya and Iron. Ferrated Elixir of Calisaya.

Phosphate of Iron (U. S. P. 1880)	256 grains.
Water, boiling	1 fluidounce.
Detannated Elixir of Cinchona	enough to make 16 fluidounces.

Dissolve the Phosphate of Iron in the boiling Water, then add enough Detannated Elixir of Cinchona to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 2 grains of Phosphate of Iron.

46. ELIXIR CINCHONÆ, FERRI, BISMUTHI ET STRYCHNINÆ.

Elixir of Cinchona, Iron, Bismuth and Strychnine.

Elixir of Calisaya, Iron, Bismuth and Strychnine.

Citrate of Bismuth and Ammonium	128 grains.
Sulphate of Strychnine	1¼ "
Water, hot	a sufficient quantity.
Elixir of Cinchona and Iron	enough to make 16 fluidounces.

Dissolve the Citrate of Bismuth and Ammonium in *one-half* (½) *fluidounce* of hot Water; allow the solution to stand until any undissolved matter has subsided; then decant the clear liquid, and add to the residue enough Water of Ammonia to dissolve it, carefully avoiding an excess. Dissolve the Sulphate of Strychnine in *one* (1) *fluidrachm* of hot Water, and having mixed the two solutions, add enough Elixir of Cinchona and Iron to make *sixteen* (16) *fluidounces.* Let the mixture stand twenty-four hours, if convenient, and filter.

Each fluidrachm contains 1 grain of Citrate of Bismuth and Ammonium; $\frac{1}{100}$ grain of Sulphate of Strychnine, and nearly 2 grains of Phosphate of Iron.

47. ELIXIR CINCHONÆ, FERRI ET BISMUTHI.

Elixir of Cinchona, Iron and Bismuth.

Elixir of Calisaya, Iron and Bismuth.

Citrate of Bismuth and Ammonium	128 grains.
Water, hot	½ fluidounce.
Elixir of Cinchona and Iron	enough to make 16 fluidounces.

Dissolve the Citrate of Bismuth and Ammonium in the hot Water, allow the solution to stand until any undissolved matter has subsided; then decant the clear liquid, and add to the residue enough Water of Ammonia to dissolve it, carefully avoiding an excess. Then mix the solution with enough Elixir of Cinchona and Iron to make *sixteen* (16) *fluidounces.* Let the mixture stand twenty-four hours, if convenient, and filter.

Each fluidrachm contains 1 grain of Citrate of Bismuth and Ammonium, and nearly 2 grains of Phosphate of Iron.

48. ELIXIR CINCHONÆ, FERRI, ET CALCII LACTOPHOSPHATIS.

Elixir of Cinchona, Iron and Lactophosphate of Calcium.

Elixir of Calisaya, Iron and Lactophosphate of Lime.

Lactate of Calcium	64 grains.
Phosphoric Acid (50%)	64 minims.
Water of Ammonia	½ fluidounce.
Citric Acid	120 grains.
Elixir of Cinchona and Iron	enough to make 16 fluidounces.

Dissolve the Lactate of Calcium in *seven* (7) *fluidounces* of Elixir of Cinchona and Iron, with the aid of the Phosphoric Acid. Then add the Citric Acid, and when this is dissolved, the Water of Ammonia. Finally add enough Elixir of Cinchona and Iron to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains ½ grain of Lactate of Calcium (or about ¾ grain of so-called Lactophosphate of Calcium), and nearly 2 grains of Phosphate of Iron.

49. ELIXIR CINCHONÆ, FERRI ET PEPSINI.

Elixir of Cinchona, Iron and Pepsin.

Elixir of Calisaya, Iron and Pepsin.

Pepsin (N. F.)		128 grains.
Hydrochloric Acid		30 minims.
Water		3 fluidounces.
Elixir of Cinchona and Iron	enough to make	16 "

Dissolve the Pepsin in the Water mixed with the Hydrochloric Acid; then add enough Elixir of Cinchona and Iron to make *sixteen* (16) *fluidounces.* Let the mixture stand a few days, if convenient, and filter.

Each fluidrachm represents 1 grain of Pepsin (N. F.), and about 1½ grains of Phosphate of Iron.

50. ELIXIR CINCHONÆ, FERRI ET STRYCHNINÆ.

Elixir of Cinchona, Iron and Strychnine.

Elixir of Calisaya, Iron and Strychnine.

Sulphate of Strychnine		1¼ grains.
Water		120 minims.
Elixir of Cinchona and Iron	enough to make	16 fluidounces.

Dissolve the Sulphate of Strychnine in the Water and add enough Elixir of Cinchona and Iron to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains $\frac{1}{100}$ grain of Sulphate of Strychnine, and about grains of Phosphate of Iron.

51. ELIXIR CINCHONÆ, PEPSINI ET STRYCHNINÆ.

Elixir of Cinchona, Pepsin and Strychnine.

Elixir of Calisaya, Pepsin and Strychnine.

Sulphate of Quinine	16 grains.
Sulphate of Cinchonine	8 "
Sulphate of Strychnine	1¼ "
Elixir of Pepsin	16 fluidounces.

Dissolve the alkaloidal salts in the Elixir, and filter, if necessary.

Each fluidrachm represents small quantities of Cinchona Alkaloids, $\frac{1}{100}$ grain of Sulphate of Strychnine, and 1 grain of Pepsin.

52. ELIXIR CORYDALIS COMPOSITUM.

Compound Elixir of Corydalis.

Fluid Extract of Corydalis		1 fluidounce.
Fluid Extract of Stillingia		1 "
Fluid Extract of Xanthoxylum		½ "
Fluid Extract of Iris		1½ fluidounces.
Alcohol		2 "
Iodide of Potassium		384 grains.
Aromatic Elixir	enough to make	16 fluidounces.

Mix the Alcohol with the Fluid Extracts, dissolve the Iodide of

Potassium, in the mixture, and add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Let the mixture stand a few days, if convenient, and filter.

Each fluidrachm contains 3 grains of Iodide of Potassium, and small quantities of the several Fluid Extracts.

53. ELIXIR CURASSAO.

Elixir of Curaçao.

Curaçao Cordial.

Spirit of Curaçao	120 minims.
Orris Root, in fine powder	30 grains.
Deodorized Alcohol	4 fluidounces.
Citric Acid	50 grains.
Syrup	8 fluidounces.
Purified Talcum	120 grains.
Water	enough to make 16 fluidounces.

Mix the Spirit of Curaçao with the Alcohol, add the Orris Root, the Purified Talcum, and *three* (3) *fluidounces* of Water. Allow the mixture to stand twelve hours, occasionally agitating; then pour it on a wetted filter, returning the first portions of the filtrate until it runs through clear, and pass enough Water through the filter to make the filtrate measure *eight* (8) *fluidounces*. In this dissolve the Citric Acid, and finally add the Syrup.

54. ELIXIR ERIODICTYI AROMATICUM.

Aromatic Elixir of Eriodictyon.

Aromatic Elixir of Yerba Santa; Elixir Corrigens.

Fluid Extract of Eriodictyon	1 fluidounce.
Syrup	8 fluidounces.
Pumice, in fine powder	½ troy ounce.
Carbonate of Magnesium	80 grains.
Compound Elixir of Taraxacum	enough to make 16 fluidounces.

Mix *seven* (7) *fluidounces* of Compound Elixir of Taraxacum with the Syrup and Pumice, then add the Fluid Extract, and mix the whole thoroughly by agitation. Shake the mixture occasionally during two hours, then allow it to settle, and carefully decant the liquid into a funnel, the neck of which contains a small pellet of absorbent cotton. Afterwards add the dregs and allow them to drain. To the filtrate add the Carbonate of Magnesium and shake occasionally during several hours. Let the mixture stand at rest during twelve hours, if convenient, then decant the liquid and filter it through paper. To the filtrate add enough Compound Elixir of Taraxacum, if necessary, to make *sixteen* (16) *fluidounces*.

Note.—This preparation is chiefly intended as a vehicle for Quinine and other bitter remedies.

55. ELIXIR ERYTHROXYLI.

Elixir of Erythroxylon.

Elixir of Coca.

Fluid Extract of Erythroxylon	2 fluidounces.
Alcohol	1 fluidounce.
Syrup	2 fluidounces.
Tincture of Vanilla	120 minims.
Purified Talcum	120 grains.
Aromatic Elixir	enough to make 16 fluidounces.

Mix the Fluid Extract with the Alcohol, the Syrup and *ten* (10) *fluidounces* of Aromatic Elixir, add the Purified Talcum and incorporate the latter thoroughly. Let the mixture stand during forty-eight hours, if convenient, shaking occasionally; then filter, add the Tincture of Vanilla to the filtrate, and pass enough Aromatic Elixir through the filter to make the product measure *sixteen* (16) *fluidounces.*

Each fluidrachm represents 7½ grains of Erythroxylon (Coca).

56. ELIXIR ERYTHROXYLI ET GUARANÆ.

Elixir of Erythroxylon and Guarana.

Elixir of Coca and Guarana.

Fluid Extract of Erythroxylon	2 fluidounces.
Fluid Extract of Guarana	2 "
Purified Talcum	120 grains.
Compound Elixir of Taraxacum	12 fluidounces.

Mix the liquids, and thoroughly incorporate the Purified Talcum with the mixture. Let it stand during forty-eight hours, if convenient, occasionally agitating, then filter.

Each fluidrachm represents 7½ grains each of Erythroxylon (Coca) and Guarana.

57. ELIXIR EUCALYPTI.

Elixir of Eucalyptus.

Fluid Extract of Eucalyptus	2 fluidounces.
Alcohol	2 "
Carbonate of Magnesium	120 grains.
Syrup of Coffee	6 fluidounces.
Compound Elixir of Taraxacum	6 "

Mix the Fluid Extract with the Alcohol, then add the other ingredients, shake the mixture occasionally during forty-eight hours, and filter.

Each fluidrachm represents 7½ grains of Eucalyptus.

58. ELIXIR EUONYMI.

Elixir of Euonymus.

Elixir of Wahoo.

Fluid Extract of Euonymus	2½ fluidounces.
Water	2 “
Syrup of Coffee	2 “
Compound Elixir of Taraxacum	9½ “

Mix them, let the mixture stand forty-eight hours, and filter.

Each fluidrachm represents about 9½ grains of Euonymus.

59. ELIXIR FERRI HYPOPHOSPHITIS.

Elixir of Hypophosphite of Iron.

Solution of Hypophosphite of Iron	768 minims.
Aromatic Elixir	enough to make 16 fluidounces.

Mix the Solution of Hypophosphite of Iron with enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Allow the mixture to stand a few days in a cool place, and filter, if necessary.

Each fluidrachm contains 1 grain of Hypophosphite of Iron (ferric).

60. ELIXIR FERRI LACTATIS.

Elixir of Lactate of Iron.

Lactate of Iron, in crusts	128 grains.
Citrate of Potassium	384 “
Aromatic Elixir	enough to make 16 fluidounces.

Triturate the Lactate of Iron with the Citrate of Potassium and about *four* (4) *fluidounces* of Aromatic Elixir, gradually added, until solution has been effected. Then add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 1 grain of Lactate of Iron.

61. ELIXIR FERRI PHOSPHATIS.

Elixir of Phosphate of Iron.

Phosphate of Iron (U. S. P. 1880)	256 grains.
Water	1 fluidounce.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Phosphate of Iron in the Water with the aid of heat; then mix this solution with a sufficient quantity of Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm contains 2 grains of Phosphate of Iron.

62. ELIXIR FERRI PHOSPHATIS, CINCHONIDINÆ ET STRYCHNINÆ.

Elixir of Phosphate of Iron, Cinchonidine and Strychnine.

Phosphate of Iron (U. S. P. 1880)	256 grains.
Citrate of Potassium	32 "
Sulphate of Cinchonidine	128 "
Sulphate of Strychnine	1¼ "
Alcohol	1 fluidounce.
Water	360 minims.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Phosphate of Iron and Citrate of Potassium in the Water, using heat, if necessary. To *twelve* (12) *fluidounces* of Aromatic Elixir, contained in a bottle, add the Alcohol, and afterwards the alkaloidal salts, and agitate until the latter are dissolved, or nearly so. Then mix the two solutions, and, having shaken the mixture, add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Finally, filter.

Each fluidrachm contains 2 grains of Phosphate of Iron, 1 grain of Sulphate of Cinchonidine, and $\frac{1}{100}$ *grain of Sulphate of Strychnine.*

Note.—When this Elixir is mixed with water, it will become cloudy or opaque through the separation of some of its constituents.

63. ELIXIR FERRI PHOSPHATIS, QUININÆ ET STRYCHNINÆ.

Elixir of Phosphate of Iron, Quinine, and Strychnine.

Phosphate of Iron (U. S. P. 1880)	256 grains.
Citrate of Potassium	32 "
Hydrochlorate of Quinine	128 "
Sulphate of Strychnine	1¼ "
Alcohol	1 fluidounce.
Water	360 minims.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Phosphate of Iron and Citrate of Potassium in the Water, using heat, if necessary. To *twelve* (12) *fluidounces* of Aromatic Elixir, contained in a bottle, add the Alcohol, and afterwards the alkaloidal salts, and agitate until the latter are dissolved, or nearly so. Then mix the two solutions, and, having shaken the mixture, add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Finally, filter.

Each fluidrachm contains 2 grains of Phosphate of Iron, 1 grain of Hydrochlorate of Quinine, and $\frac{1}{100}$ *grain of Sulphate of Strychnine.*

Note.—When this Elixir is mixed with water, it will become cloudy or opaque through the separation of some of its constituents.

64. ELIXIR FERRI PYROPHOSPHATIS.

Elixir of Pyrophosphate of Iron.

Pyrophosphate of Iron (U. S. P. 1880)	256 grains.
Water	1 fluidounce.
Aromatic Elixir . . . enough to make	16 fluidounces.

Dissolve the Pyrophosphate of Iron in the Water, and add enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm contains 2 grains of Pyrophosphate of Iron.

65. ELIXIR FERRI, QUININÆ ET STRYCHNINÆ.

Elixir of Iron, Quinine and Strychnine.

Tincture of Citro-Chloride of Iron	2 fluidounces.
Sulphate of Quinine	128 grains.
Sulphate of Strychnine	1¼ "
Alcohol	½ fluidounce.
Aromatic Elixir . . . enough to make	16 fluidounces.

Dissolve the alkaloidal salts in about *twelve* (12) *fluidounces* of Aromatic Elixir, then add the Tincture and the Alcohol, and finally, enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm represents about 1 grain of Ferric Chloride, 1 grain of Sulphate of Quinine, and $\frac{1}{100}$ grain of Sulphate of Strychnine.

66. ELIXIR FRANGULÆ.

Elixir of Frangula.

Elixir of Buckthorn.

Fluid Extract of Frangula (U. S. P.)	4 fluidounces.
Alcohol	1 fluidounce.
Compound Elixir of Taraxacum	4 fluidounces.
Aromatic Elixir	7 "

Mix them, allow the mixture to stand during forty-eight hours, if convenient, and filter.

Each fluidrachm represents 15 grains of Frangula.

67. ELIXIR GENTIANÆ.

Elixir of Gentian.

Extract of Gentian (U. S. P.)	70 grains.
Aromatic Spirit	180 minims.
Tincture of Vanilla	120 "
Syrup	1 fluidounce.
Aromatic Elixir . . . enough to make	16 fluidounces.

Dissolve the Extract of Gentian in about *two* (2) *fluidounces* of

Aromatic Elixir, next add the Syrup, Aromatic Spirit, and Tincture of Vanilla, and lastly, enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm represents about 2 grains of Gentian.

68. ELIXIR GENTIANÆ ET FERRI PHOSPHATIS.

Elixir of Gentian and Phosphate of Iron.

Elixir Gentianæ Ferratum. Ferrated Elixir of Gentian. Ferrophosphated Elixir of Gentian.

Phosphate of Iron (U. S. P. 1880)	128 grains.
Water	½ fluidounce.
Elixir of Gentian	enough to make 16 fluidounces.

Dissolve the Phosphate of Iron in the Water with the aid of heat, and add enough Elixir of Gentian to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm represents 1 grain of Phosphate of Iron, and nearly 2 grains of Gentian.

69. ELIXIR GENTIANÆ CUM TINCTURA FERRI CHLORIDI.

Elixir of Gentian with Tincture of Chloride of Iron.

Tincture of Citro-Chloride of Iron	640 minims.
Elixir of Gentian	enough to make 16 fluidounces.

Mix the Tincture of Citro-Chloride of Iron with enough Elixir of Gentian to make *sixteen* (16) *fluidounces*, and filter, if necessary.

Each fluidrachm represents about ⅔ grain of Ferric Chloride, and nearly 2 grains of Gentian.

70. ELIXIR GLYCYRRHIZÆ.

Elixir of Glycyrrhiza.

Elixir of Liquorice.

Purified Extract of Liquorice	1 troy ounce.
Water of Ammonia	a sufficient quantity.
Aromatic Elixir	enough to make 16 fluidounces.

Triturate the Purified Extract of Liquorice with *twelve* (12) *fluidounces* of Aromatic Elixir gradually added. To *ten* (10) *fluidounces* of this mixture add Water of Ammonia in drops, until it is in slight excess. Mix this with the reserved portion, and finally, add enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

71. ELIXIR GLYCYRRHIZÆ AROMATICUM.

Aromatic Elixir of Glycyrrhiza.

Aromatic Elixir of Liquorice.

Fluid Extract of Glycyrrhiza	2 fluidounces.
Oil of Cloves	6 minims.
Oil of Cinnamon (Ceylon)	6 “
Oil of Nutmeg	4 “
Oil of Fennel	12 “
Purified Talcum	360 grains.
Aromatic Elixir	enough to make 16 fluidounces.

Triturate the Oils with the Purified Talcum and the Fluid Extract, then add *fourteen* (14) *fluidounces* of Aromatic Elixir, filter and pass enough Aromatic Elixir through the filter to make *sixteen* (16) *fluidounces.*

72. ELIXIR GRINDELIÆ.

Elixir of Grindelia.

Fluid Extract of Grindelia	1 fluidounce.
Aromatic Spirit	2 fluidounces.
Compound Elixir of Taraxacum	13 “

Mix them, allow the mixture to stand a few days, if convenient, then filter.

Each fluidounce represents 30 grains of Grindelia.

73. ELIXIR GUARANÆ.

Elixir of Guarana.

Fluid Extract of Guarana (U. S. P.)	3 fluidounces.
Aromatic Elixir	3 “
Compound Elixir of Taraxacum	10 “

Mix them; allow the mixture to stand during forty-eight hours, if convenient, and filter.

Each fluidrachm represents about 11 grains of Guarana.

74. ELIXIR HUMULI.

Elixir of Humulus.

Elixir of Hops.

Fluid Extract of Hops (N. F.)	2 fluidounces.
Carbonate of Magnesium	120 grains.
Tincture of Vanilla	240 minims.
Compound Elixir of Taraxacum	2 fluidounces.
Aromatic Elixir	enough to make 16 “

Triturate the Fluid Extract of Hops with the Carbonate of Magnesium, then gradually add the Compound Elixir of Taraxacum, Tincture of Vanilla, and enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Allow the mixture to stand several days, if convenient, occasionally agitating; then filter.

Each fluidrachm represents 7½ grains of Humulus (Hops).

75. ELIXIR HYPOPHOSPHITUM.

Elixir of Hypophosphites.

Hypophosphite of Calcium		384 grains.
Hypophosphite of Sodium		128 "
Hypophosphite of Potassium		128 "
Citric Acid		30 "
Water		4 fluidounces.
Glycerin		½ fluidounce.
Compound Spirit of Cardamom		½ "
Aromatic Elixir	enough to make	16 fluidounces.

Dissolve the Hypophosphites and the Citric Acid in the Water; then add the Glycerin, Compound Spirit of Cardamom, and enough Aromatic Elixir to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm contains 3 grains of Hypophosphite of Calcium, and 1 grain, each, of the Hypophosphites of Sodium and Potassium.

76. ELIXIR HYPOPHOSPHITUM CUM FERRO.

Elixir of Hypophosphites with Iron.

Hypophosphite of Calcium		188 grains.
Hypophosphite of Sodium		128 "
Hypophosphite of Potassium		64 "
Sulphate of Iron, in clear crystals		96 "
Citric Acid		30 "
Water		4 fluidounces.
Syrup		4 "
Aromatic Elixir	enough to make	16 "

Dissolve the Hypophosphites in *three* (3) *fluidounces* of Water, and add the Syrup. Dissolve the Sulphate of Iron in the remainder of the Water, and mix this with the other solution. Then add *six* (6) *fluidounces* of Aromatic Elixir, set the mixture aside, in a cold place, for twelve hours, and filter from the deposited sulphate of calcium. Finally dissolve the Citric Acid in the filtrate, and pass enough Aromatic Elixir through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains about ½ grain of Hypophosphite of Iron (ferrous), about 1 grain, each, of the Hypophosphites of Calcium and Sodium, and ½ grain of Hypophosphite of Potassium.

77. ELIXIR LITHII BROMIDI.

Elixir of Bromide of Lithium.

Bromide of Lithium	640 grains.
Citric Acid	30 “
Adjuvant Elixir	enough to make 16 fluidounces.

Dissolve the Bromide of Lithium and the Citric Acid in about *twelve* (12) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 5 grains of Bromide of Lithium.

78. ELIXIR LITHII CITRATIS.

Elixir of Citrate of Lithium.

Citrate of Lithium	640 grains
Adjuvant Elixir	enough to make 16 fluidounces.

Dissolve the Citrate of Lithium in about *twelve* (12) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 5 grains of Citrate of Lithium.

79. ELIXIR LITHII SALICYLATIS.

Elixir of Salicylate of Lithium.

Salicylate of Lithium	640 grains.
Adjuvant Elixir	enough to make 16 fluidounces.

Dissolve the Salicylate of Lithium in about *twelve* (12) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 5 grains of Salicylate of Lithium.

80. ELIXIR MALTI ET FERRI.

Elixir of Malt and Iron.

Extract of Malt	4 fluidounces.
Phosphate of Iron (U. S. P. 1880)	128 grains.
Water	½ fluidounce.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Phosphate of Iron in the Water by the aid of heat, mix the solution with the Extract of Malt previously introduced into a graduated bottle, and add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Set the mixture aside for twenty-four hours, and filter.

Each fluidrachm represents 1 grain of Phosphate of Iron, and 15 minims of Extract of Malt.

Note.—Extract of Malt, most suitable for this preparation, should have about the consistence of Balsam of Peru, at a temperature of about 15° C. (59° F.)

81. ELIXIR PEPSINI.

Elixir of Pepsin.

Pepsin (N. F.)	128 grains.
Hydrochloric Acid	30 minims.
Glycerin	2 fluidounces.
Compound Elixir of Taraxacum	1 fluidounce.
Alcohol	3 fluidounces.
Purified Talcum	120 grains.
Sugar	4 troy ounces.
Water	enough to make 16 fluidounces.

Mix the Pepsin with *six* (6) *fluidounces* of Water, add the Glycerin and Acid, and agitate until solution has been effected. Then add the Compound Elixir of Taraxacum, Alcohol, and the Purified Talcum, and mix thoroughly. Set the mixture aside for a few hours, occasionally agitating. Then filter it through a wetted filter, dissolve the Sugar in the filtrate, and pass enough Water through the filter to make the whole product measure *sixteen* (16) *fluidounces.*

Each fluidrachm represents 1 grain of Pepsin (N. F.)

82. ELIXIR PEPSINI, BISMUTHI ET STRYCHNINÆ.

Elixir of Pepsin, Bismuth and Strychnine.

Sulphate of Strychnine	1¼ grains.
Elixir of Pepsin and Bismuth	16 fluidounces.

Dissolve the Sulphate of Strychnine in the Elixir.

Each fluidrachm represents $\frac{1}{100}$ grain of Sulphate of Strychnine, 1 grain of Pepsin (N. F.), and 2 grains of Citrate of Bismuth and Ammonium.

83. ELIXIR PEPSINI ET BISMUTHI.

Elixir of Pepsin and Bismuth.

Pepsin (N. F.)	128 grains.
Citrate of Bismuth and Ammonium	256 “
Water of Ammonia	a sufficient quantity.
Glycerin	2 fluidounces.
Alcohol	3 “
Syrup	4 “
Compound Elixir of Taraxacum	1 fluidounce.
Purified Talcum	120 grains.
Water	enough to make 16 fluidounces.

Dissolve the Pepsin in *four* (4) *fluidounces* of Water. Dissolve the Citrate of Bismuth and Ammonium in *one* (1) *fluidounce* of warm Water, allow the solution to stand until clear, if necessary; then decant the clear liquid, and add to the residue just enough Water of Ammonia, to dissolve it, carefully avoiding an excess. Then mix the two solutions, and add the Glycerin, Compound Elixir of Taraxacum, and Alcohol. Thoroughly incorporate the Purified Talcum with the mixture, filter it through a wetted filter, and pass enough Water through the filter to make the filtrate measure *thirteen* (13) *fluidounces*. To this add the Syrup.

Each fluidrachm represents 1 grain of Pepsin (N. F.), and 2 grains of Citrate of Bismuth and Ammonium.

84. ELIXIR PEPSINI ET FERRI.

Elixir of Pepsin and Iron.

Tincture of Citro-Chloride of Iron	512 minims.
Elixir of Pepsin	enough to make 16 fluidounces.

Mix the Tincture of Citro-Chloride of Iron with a sufficient quantity of Elixir of Pepsin to make *sixteen* (16) *fluidounces*, and filter, if necessary.

Each fluidrachm represents about ½ grain of Chloride of Iron (ferric), and nearly 1 grain of Pepsin (N. F.).

85. ELIXIR PHOSPHORI.

Elixir of Phosphorus.

Spirit of Phosphorus	3¾ fluidounces.
Oil of Star-anise	16 minims.
Glycerin	9 fluidounces
Aromatic Elixir	enough to make 16 "

To the Spirit of Phosphorus add the Oil of Star-anise and Glycerin, and shake gently until they form a clear liquid. Then add the Aromatic Elixir, in small portions at a time, gently agitating after each addition, until a clear mixture results.

Keep the product in dark amber-colored vials, in a cool and dark place. It should not be prepared in quantities larger than will be consumed within a few months.

Each fluidrachm contains $\frac{1}{50}$ grain of Phosphorus.

86. ELIXIR PHOSPHORI ET NUCIS VOMICÆ.

Elixir of Phosphorus and Nux Vomica.

Tincture of Nux Vomica	256 minims.
Elixir of Phosphorus	enough to make 16 fluidounces.

Mix them. This preparation should be freshly made, when wanted for use.

Each fluidrachm represents 2 minims of Tincture of Nux Vomica, and nearly $\frac{1}{50}$ grain of Phosphorus.

87. ELIXIR PICIS COMPOSITUM.

Compound Elixir of Tar.

Syrup of Wild Cherry	3 fluidounces.
Syrup of Tolu	3 "
Sulphate of Morphine	2½ grains.
Methylic Alcohol	360 minims.
Water	a sufficient quantity.
Wine of Tar	enough to make 16 fluidounces.

Dissolve the Sulphate of Morphine in about *one* (1) *fluidrachm* of hot Water, and add the solution to the two Syrups previously mixed. Then add the Methylic Alcohol and enough Wine of Tar to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains about $\frac{1}{50}$ *grain of Sulphate of Morphine.*

Note.—Much of the commercial "Wood Spirit" or "Wood Naphtha" is unfit for medicinal purposes. Refined Wood Naphtha or Methylic Alcohol should be colorless and freely miscible to a clear liquid with water, alcohol and ether. Its odor, which is characteristic, should be free from empyreuma. It should contain at least 90 per cent. of absolute Methylic Alcohol, which corresponds to a specific gravity of 0.846 at 15° C. (59° F.). On mixing methylic alcohol cautiously with one-fourth its volume of sulphuric acid, the liquid should remain colorless or acquire not more than a very pale yellowish-red tint; and on gently heating methylic alcohol with an equal volume of a 10% solution of potassa, the mixture should not acquire a brown color.

88. ELIXIR PILOCARPI.

Elixir of Pilocarpus.

Elixir of Jaborandi.

Fluid Extract of Pilocarpus	1 fluidounce.
Syrup of Coffee	3 fluidounces.
Tincture of Vanilla	½ fluidounce.
Compound Elixir of Taraxacum	enough to make 16 fluidounces.

Mix them, allow the mixture to stand during four days, if convenient, and filter.

Each fluidrachm represents 3¾ grains of Pilocarpus.

89. ELIXIR POTASSII ACETATIS.

Elixir of Acetate of Potassium.

Acetate of Potassium	640 grains.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Acetate of Potassium in *twelve* (12) *fluidounces* of Aromatic Elixir, then add enough of the latter to make *sixteen* (16) *fluidounces.* Filter, if necessary.

Each fluidrachm contains 5 grains of Acetate of Potassium.

90. ELIXIR POTASSII ACETATIS ET JUNIPERI.

Elixir of Acetate of Potassium and Juniper.

Acetate of Potassium		640 grains.
Fluid Extract of Juniper		2 fluidounces.
Carbonate of Magnesium		120 grains.
Aromatic Elixir	enough to make	16 fluidounces.

Triturate the Fluid Extract of Juniper with the Carbonate of Magnesium, then add *twelve* (12) *fluidounces* of Aromatic Elixir in which the Acetate of Potassium has previously been dissolved. Filter, and add enough Aromatic Elixir through the filter, to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 5 grains of Acetate of Potassium and 7½ grains of Juniper.

91. ELIXIR POTASSII BROMIDI.

Elixir of Bromide of Potassium.

Bromide of Potassium		1280 grains.
Citric Acid		30 "
Adjuvant Elixir	enough to make	16 fluidounces.

Dissolve the Bromide of Potassium and the Citric Acid in about *twelve* (12) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 10 grains of Bromide of Potassium.

92. ELIXIR QUININÆ COMPOSITUM.

Compound Elixir of Quinine.

Sulphate of Quinine	16 grains.
Sulphate of Cinchonidine	8 "
Sulphate of Cinchonine	8 "
Aromatic Elixir	16 fluidounces.

Add the alkaloidal salts to the Aromatic Elixir, and dissolve them by agitation. Finally filter.

Each fluidounce contains 1 grain of Sulphate of Quinine and ½ grain, each, of the Sulphates of Cinchonidine and Cinchonine.

Note.—This preparation is chiefly intended as a substitute for Elixir of Cinchona in certain cases, when the presence of other constituents of Cinchona is deemed unnecessary, or where the Elixir is intended rather as a vehicle than a medicine.

If it is desired to impart a color to this Elixir, this may be effected by the addition of 120 minims of Compound Tincture of Cudbear to each pint.

93. ELIXIR QUININÆ ET PHOSPHATUM COMPOSITUM.

Compound Elixir of Quinine and Phosphates.

Sulphate of Quinine	32	grains.
Phosphate of Iron (U. S. P. 1880)	128	"
Citrate of Potassium	128	"
Syrup of Lactophosphate of Calcium	4	fluidounces.
Water	½	fluidounce.
Aromatic Elixir	enough to make 16	fluidounces.

Dissolve the Sulphate of Quinine in *ten* (10) *fluidounces* of Aromatic Elixir, if necessary with the aid of a gentle heat. Dissolve the Phosphate of Iron and the Citrate of Potassium in the Water, and add the solution to that first prepared. Then add the Syrup of Lactophosphate of Calcium, and lastly, enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Filter, if necessary.

Each fluidrachm contains ¼ grain of Sulphate of Quinine, 1 grain of Phosphate of Iron, and about ¾ grain of so-called Lactophosphate of Calcium.

94. ELIXIR QUININÆ VALERIANATIS ET STRYCHNINÆ.

Elixir of Valerianate of Quinine and Strychnine.

Valerianate of Quinine	128	grains.
Sulphate of Strychnine	1¼	"
Compound Tincture of Cudbear	120	minims.
Aromatic Elixir	enough to make 16	fluidounces

Triturate the Valerianate of Quinine and the Sulphate of Strychnine with about *eight* (8) *fluidounces* of Aromatic Elixir, until they are dissolved. Then add the Compound Tincture of Cudbear, and lastly, enough Aromatic Elixir to make *sixteen* (16) *fluidounces* Filter, if necessary.

Each fluidrachm contains 1 grain of Valerianate of Quinine and $\frac{1}{100}$ grain of Sulphate of Strychnine.

95. ELIXIR RHAMNI PURSHIANÆ.

Elixir of Rhamnus Purshiana.

Elixir of Cascara Sagrada.

Fluid Extract of Rhamnus Purshiana	4	fluidounces.
Elixir of Glycyrrhiza	4	"
Compound Elixir of Taraxacum	8	"

Mix them. Allow the mixture to stand a few days, if convenient, and filter.

Each fluidrachm represents 15 grains of Rhamnus Purshiana.

96. ELIXIR RHAMNI PURSHIANÆ COMPOSITUM.

Compound Elixir of Rhamnus Purshiana.

Compound Elixir of Cascara Sagrada. Elixir Laxativum; Elixir Purgans; Laxative Elixir.

Fluid Extract of Rhamnus Purshiana	2 fluidounces.
Fluid Extract of Senna	1¼ “
Fluid Extract of Juglans	1 fluidounce.
Fluid Extract of Glycyrrhiza	½ “
Compound Tincture of Cardamom	½ “
Aromatic Spirit	2 fluidounces.
Syrup	6 “
Purified Talcum	120 grains.
Water	enough to make 16 fluidounces.

Mix the Fluid Extracts with the Compound Tincture of Cardamom and the Aromatic Spirit; then add the Syrup, and lastly, enough Water to make *sixteen* (16) *fluidounces*. Incorporate the Purified Talcum thoroughly with the mixture, and filter.

The average dose of this preparation, for an adult, is 1 to 2 teaspoonfuls.

97. ELIXIR RHEI.

Elixir of Rhubarb.

Sweet Tincture of Rhubarb (U. S. P.)	8 fluidounces.
Deodorized Alcohol	1 fluidounce.
Water	3 fluidounces.
Glycerin	2 “
Syrup	2 “

Mix them, and filter.

Each fluidrachm represents about 2¼ grains of Rhubarb.

98. ELIXIR RHEI ET MAGNESII ACETATIS.

Elixir of Rhubarb and Acetate of Magnesium.

Elixir Rhei et Magnesiæ. Elixir of Rhubarb and Magnesia.

Magnesia, calcined	144 grains.
Acetic Acid (U. S. P.)	a sufficient quantity.
Fluid Extract of Rhubarb	2 fluidounces.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Magnesia in *two and one-half* (2½) *fluidounces* of Acetic Acid, with the aid of a gentle heat, adding, if necessary, a little more Acetic Acid, drop by drop, until the solution is neutral to test-paper. Then add the Fluid Extract and enough Aromatic Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm represents about 4 grains of Acetate of Magnesium and 7½ grains of Rhubarb.

99. ELIXIR RUBI COMPOSITUM.

Compound Elixir of Blackberry.

Blackberry Root	2 troy ounces.
Galls	2 " "
Cinnamon, Saigon	2 " "
Cloves	½ troy ounce.
Mace	¼ " "
Ginger	¼ " "
Diluted Alcohol	a sufficient quantity.
Blackberry Juice, recently expressed	3 pints.
Syrup	3 "

Reduce the solids to a moderately coarse (No. 40) powder, moisten it with Diluted Alcohol, and percolate it with this menstruum in the usual manner, until *two* (2) *pints* of percolate are obtained. To this add the Blackberry Juice and Syrup, and mix thoroughly.

100. ELIXIR SODII BROMIDI.

Elixir of Bromide of Sodium.

Bromide of Sodium	1280 grains.
Citric Acid	30 "
Adjuvant Elixir	enough to make 16 fluidounces.

Dissolve the Bromide of Sodium and the Citric Acid in about *twelve* (12) *fluidounces* of Adjuvant Elixir by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter, if necessary.

Each fluidrachm contains 10 grains of Bromide of Sodium.

101. ELIXIR SODII HYPOPHOSPHITIS.

Elixir of Hypophosphite of Sodium.

Hypophosphite of Sodium	256 grains.
Citric Acid	30 "
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Hypophosphite of Sodium and the Citric Acid in about *twelve* (12) *fluidounces* of Aromatic Elixir, by agitation. Then add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*, and filter, if necessary.

Each fluidrachm contains 2 grains of Hypophosphite of Sodium.

102. ELIXIR SODII SALICYLATIS.

Elixir of Salicylate of Sodium.

Salicylate of Sodium	640 grains.
Aromatic Elixir	enough to make 16 fluidounces.

Dissolve the Salicylate of Sodium in about *twelve* (12) *fluidounces* of Aromatic Elixir, by agitation. Then add enough Aromatic Elixir to make *sixteen* (16) *fluidounces*, and filter, if necessary.

This preparation should be freshly prepared, when required for use.

Each fluidrachm contains 5 grains of Salicylate of Sodium.

103. ELIXIR STILLINGIÆ COMPOSITUM.

Compound Elixir of Stillingia.

Compound Fluid Extract of Stillingia	4 fluidounces.
Aromatic Elixir	12 "

Mix them, allow the mixture to stand a few days, or longer, if convenient, and filter.

Each fluidrachm represents 15 minims of Compound Fluid Extract of Stillingia.

104. ELIXIR STRYCHNINÆ VALERIANATIS.

Elixir of Valerianate of Strychnine.

Valerianate of Strychnine	1¼ grains.
Acetic Acid	a sufficient quantity.
Tincture of Vanilla	120 minims.
Compound Tincture of Cudbear	120 "
Aromatic Elixir	enough to make 16 fluidounces

Triturate the Valerianate of Strychnine with about *one* (1) *fluidounce* of Aromatic Elixir, gradually added, and effect complete solution by the addition of one or more drops of Acetic Acid, avoiding an excess. Then add the Tinctures, and lastly, enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Filter, if necessary.

Each fluidrachm contains $\frac{1}{100}$ grain of Valerianate of Strychnine.

105. ELIXIR TARAXACI COMPOSITUM.

Compound Elixir of Taraxacum.

Taraxacum	1 troy ounce.
Wild Cherry	1 " "
Sweet Orange Peel, recently dried	1 " "
Glycyrrhiza, Russian, peeled	3 troy ounces.
Cinnamon, Saigon	120 grains.
Cardamom	120 "
Canada Snake Root	120 "
Caraway	120 "
Cloves	40 "
Alcohol, Water, each	a sufficient quantity.
Syrup	32 fluidounces.

Reduce the solid substances to a moderately coarse (No. 40) powder, and percolate, in the usual manner, with a mixture of *one* (1) *volume* of Alcohol and *two* (2) *volumes* of Water, until *sixteen* (16) *fluidounces* of percolate are obtained. Lastly, add the Syrup, let the mixture stand a few days, if possible, and filter.

Note.—If a precipitate should make its appearance in this preparation on standing, it ought to be removed by filtration. This Elixir is chiefly intended as a vehicle or corrigent, to cover the bitter taste of quinine and similar substances.

106. ELIXIR TURNERÆ.

Elixir of Turnera.

Elixir of Damiana.

Fluid Extract of Turnera	2½ fluidounces.
Carbonate of Magnesium	240 grains.
Alcohol	4 fluidounces.
Glycerin	1 fluidounce.
Aromatic Elixir	enough to make 16 fluidounces.

Mix the Fluid Extract with the Alcohol, Glycerin, and *eight* (8) *fluidounces* of Aromatic Elixir. Incorporate the Carbonate of Magnesium thoroughly with the mixture by trituration. Then filter through a wetted filter, and pass enough Aromatic Elixir through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents about 9½ grains of Turnera.

107. ELIXIR VIBURNI OPULI COMPOSITUM.

Compound Elixir of Viburnum Opulus.

Compound Elixir of Crampbark.

Fluid Extract of Viburnum Opulus	1¼	fluidounces.
Fluid Extract of Trillium	2½	"
Fluid Extract of Aletris	1¼	"
Compound Elixir of Taraxacum	11	"

Mix them, allow the mixture to stand a few days, and filter.

108. ELIXIR VIBURNI PRUNIFOLII.

Elixir of Viburnum Prunifolium.

Elixir of Black Haw.

Fluid Extract of Viburnum Prunifolium	2 fluidounces.
Compound Tincture of Cardamom	1 fluidounce.
Aromatic Elixir	13 fluidounces.

Mix them, allow the mixture to stand a few days, and filter.

Each fluidrachm represents about 7½ grains of Viburnum Prunifolium.

109. ELIXIR ZINCI VALERIANATIS.

Elixir of Valerianate of Zinc.

Valerianate of Zinc	128 grains.
Stronger Solution of Citrate of Ammonium	1½ fluidounces.
Alcohol	2 "
Oil of Bitter Almond	1 drop.
Compound Tincture of Cudbear	120 minims.
Aromatic Elixir	enough to make 16 fluidounces.

Mix the Stronger Solution of Citrate of Ammonium with *four* (4) *fluidounces* of Aromatic Elixir and the Alcohol, and triturate the Valerianate of Zinc with this mixture, added gradually and in portions, until solution has been effected. Then add the Oil of Bitter Almond, the Compound Tincture of Cudbear, and finally, enough Aromatic Elixir to make *sixteen* (16) *fluidounces*. Allow the mixture to stand a few days, and filter.

Each fluidrachm contains 1 grain of Valerianate of Zinc.

110. EMPLASTRUM AROMATICUM.

Aromatic Plaster.

Spice Plaster.

Cloves	10 parts.
Cinnamon, Saigon	10 "
Ginger	10 "
Capsicum	5 "
Camphor	5 "
Cotton Seed Oil	35 "
Lead Plaster	25 "

Melt together the Lead Plaster and Cotton Seed Oil, with the aid of heat. Cool the mixture and, while it is still soft, thoroughly incorporate with it the aromatic ingredients, previously reduced to a very fine powder.

111. EMPLASTRUM FUSCUM CAMPHORATUM.

Camphorated Brown Plaster.

Emplastrum Matris Camphoratum; Camphorated Mother's Plaster.

Red Oxide of Lead	30 parts.
Olive Oil	60 "
Yellow Wax	15 "
Camphor	1 part.

Triturate the Red Oxide of Lead with a portion of the Oil in a capacious copper kettle until a smooth paste results. Then add the remainder of the Oil, excepting a small quantity required for trituration with the Camphor, and boil the whole over a naked fire, under constant stirring, until gas bubbles rise, or until the red color of the mixture begins to turn brown. Then moderate the heat, but keep up the stirring until the mixture has acquired a dark-brown color, and from time to time allow some drops of it to fall into cold water to test its consistence. When this is satisfactory, remove the vessel from the fire, add the Wax in small pieces, and finally the Camphor, previously rubbed to a smooth paste with a little Olive Oil. Mix thoroughly, allow the mixture to become somewhat cool, and while it is still warm, pour the plaster into paper-moulds previously coated with mucilage containing about five per cent. of glycerin, and dried.

Note.—This preparation is officinal in the *German Pharmacopœia.*

112. EMPLASTRUM PICIS LIQUIDÆ COMPOSITUM.

Compound Tar Plaster.

Resin	25 parts.
Tar	20 "
Podophyllum, in No. 60 powder	5 "
Phytolacca Root, in No. 60 powder	5 "
Sanguinaria, in No. 60 powder	5 "

Melt the Resin and Tar together, then stir in the mixed powders, and as the mass cools, mould it into rolls, or pour it into boxes.

113. EMULSIO CHLOROFORMI.

Emulsion of Chloroform.

Chloroform	40 minims.
Tincture of Quillaja	30 "
Acacia, in fine powder	12 grains.
Water . . . enough to make	2 fluidounces.

Put the Chloroform and the Tincture of Quillaja into a two-ounce vial, add the Powdered Acacia, shake, then add the Water, and mix. Shake the mixture before using.

Each fluidrachm contains 2½ minims of Chloroform.

114. EMULSIO OLEI MORRHUÆ.

Emulsion of Cod-Liver Oil.

I. *Irish Moss Emulsion of Cod-Liver Oil.*

Cod-Liver Oil	8 fluidounces.
Mucilage of Irish Moss (N. F.)	5 "
Syrup of Tolu	2 "
Flavoring	a sufficient quantity.
Water . . . enough to make	16 fluidounces.

Pour the Mucilage of Irish Moss into a suitable bottle, add the Cod-Liver Oil in divided portions, shaking well after each addition, and, when a perfect emulsion is formed, add the Syrup of Tolu, and

Flavoring, and lastly, enough Water to make *sixteen* (16) *fluidounces.* Finally, mix the whole thoroughly together.

This emulsion may also be prepared by mixing the Mucilage of Irish Moss with the Oil and other ingredients in a mortar, or, when larger quantities are to be prepared, it may be mixed by some mechanical contrivance.

Note.—When Emulsion of Cod-Liver Oil, particularly that made with Irish Moss, is to be kept for some time, its deterioration may be prevented or retarded by the addition of *one* (1) *fluidounce* of Alcohol in place of the same quantity of Water, after the oil has been emulsified.

Emulsion of Cod-Liver Oil may also be prepared by any other method capable of emulsifying the oil, the following being given as examples:

II. *Acacia Emulsion of Cod-Liver Oil.*

Cod-Liver Oil	8 fluidounces.
Acacia, in fine powder	1½ troy ounces.
Syrup of Tolu	2 fluidounces.
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

Triturate the Acacia with *three* (3) *fluidounces* of Water to a smooth paste; then add the Cod-Liver Oil, and the Syrup of Tolu, alternately, and in divided portions, triturating well until the last added portion of the Oil is thoroughly emulsified. Next add the Flavoring, and lastly, enough Water to make *sixteen* (16) *fluidounces.* Finally mix the whole thoroughly together.

III. *Glyconin Emulsion of Cod-Liver Oil.*

Cod-Liver Oil	8 fluidounces.
Glycerite of Yolk of Egg (U. S. P.)	2½ "
Syrup of Tolu	2 "
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

Triturate the Glycerite of Yolk of Egg (Glyconin) in a mortar with the Oil, added in small portions at a time, and thoroughly incorporate each portion before adding the next. Then, continuing the trituration, gradually add the Syrup of Tolu, and Flavoring. Finally add enough Water to make *sixteen* (16) *fluidounces*, and mix the whole thoroughly together.

IV. *Quillaja Emulsion of Cod-Liver Oil.*

Cod-Liver Oil	8 fluidounces.
Tincture of Quillaja (N. F.)	1 fluidounce.
Syrup of Tolu	2 fluidounces.
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

Pour the Tincture into a suitable bottle, then add the Cod-Liver Oil in portions of about *two* (2) *fluidounces* each, and shake after each addition until a perfect emulsion results. Next add the Syrup of Tolu, and the Flavoring, and lastly, enough Water to make *sixteen* (16) *fluidounces*. Finally, mix the whole thoroughly together.

An 85-per-cent. Emulsion of Cod-Liver Oil may be prepared by mixing in the manner just described:

Cod-Liver Oil	8½ fluidounces.
Tincture of Quillaja (N. F.)	1 fluidounce.
Flavoring	a sufficient quantity.
Syrup of Tolu	enough to make 10 fluidounces.

Note.—Emulsion of Cod-Liver Oil made with Quillaja should not be dispensed without the direction or consent of the prescriber.

V. *Dextrin Emulsion of Cod-Liver Oil.*

Cod-Liver Oil	8 fluidounces.
Mucilage of Dextrin (N. F.)	5 “
Syrup of Tolu	2 “
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

To the Mucilage of Dextrin contained in a suitable bottle, add the Cod-Liver Oil, first in small portions, agitating each time, until the last added portion is emulsified. Then add the Flavoring, the Syrup of Tolu, and lastly, enough Water to make *sixteen* (16) *fluidounces*, and mix the whole thoroughly together.

Flavoring.—Since no single or compound aromatic can be devised which would be acceptable under all circumstances as a flavoring for Emulsion of Cod-Liver Oil, the selection of the most suitable aromatic must be left to the prescriber or dispenser. Among those which are found to be most generally serviceable are the following, the quantities given below being intended for *one* (1) *pint* of finished emulsion, though in some cases a smaller or a larger quantity, in the same proportions, may be preferable:

1.	Oil of Gaultheria	30 minims.
2.	Oil of Gaultheria	15 minims.
	Oil of Sassafras	15 “
3.	Aromatic Spirit (N. F.)	120 minims.
4.	Oil of Gaultheria	15 minims.
	Oil of Bitter Almond.	2 “
	Oil of Coriander	2 “
5.	Oil of Gaultheria	10 minims.
	Oil of Sassafras	10 “
	Oil of Bitter Almond.	2 “
6.	Oil of Gaultheria	20 minims.
	Oil of Bitter Almond.	20 “
7.	Oil of Neroli	12 minims.
	Oil of Bitter Almond.	12 “
	Oil of Cloves	2 “

115. EMULSIO OLEI MORRHUÆ CUM CALCII ET SODII PHOSPHATIBUS.

Emulsion of Cod-Liver Oil with Phosphates of Calcium and Sodium.

Emulsion of Cod-Liver Oil with Phosphates of Lime and Soda.

Cod-Liver Oil	8 fluidounces.
Mucilage of Irish Moss (N. F.)	5 "
Phosphate of Calcium	128 grains.
Phosphate of Sodium	128 "
Syrup of Tolu	1 fluidounce.
Alcohol	1 "
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

Dissolve the Phosphate of Sodium in the Mucilage of Irish Moss, and emulsify the Cod-Liver Oil, with the latter, as directed under *Emulsio Olei Morrhuæ.* Then triturate the Phosphate of Calcium with the Syrup of Tolu, add the mixture to the emulsion, afterwards add the Alcohol and Flavoring, and finally enough Water to make *sixteen* (16) *fluidounces.* Mix the whole thoroughly together.

Note.—If another method of emulsifying the oil is adopted, the Phosphate of Sodium should be dissolved in the aqueous portion of the mixture, and the Phosphate of Calcium incorporated mechanically.

116. EMULSIO OLEI MORRHUÆ CUM CALCII LACTOPHOSPHATE.

Emulsion of Cod-Liver Oil with Lactophosphate of Calcium.

Emulsion of Cod-Liver Oil with Lactophosphate of Lime.

Cod-Liver Oil	8 fluidounces.
Mucilage of Irish Moss (N. F.)	5 "
Lactate of Calcium	256 grains.
Phosphoric Acid (50%)	256 minims.
Syrup of Tolu	1 fluidounce.
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

To the Mucilage of Irish Moss, contained in a suitable bottle, gradually add the Cod-Liver Oil and emulsify the latter as directed under *Emulsio Olei Morrhuæ.* Dissolve the Lactate of Calcium in *one* (1) *fluidounce* of Water with the aid of the Phosphoric Acid, add the solution gradually to the emulsion, then the Syrup of Tolu, the Flavoring, and lastly, enough Water to make *sixteen* (16) *fluidounces.* Mix the whole thoroughly together.

This emulsion should be freshly prepared when wanted for use.

Note.—If any other method of emulsifying the oil is adopted, the solution of Lactophosphate of Calcium should be made to replace an equivalent volume of the aqueous portion of the emulsion.

117. EMULSIO OLEI MORRHUÆ CUM CALCII PHOSPHATE.

Emulsion of Cod-Liver Oil with Phosphate of Calcium.

Emulsion of Cod-Liver Oil with Phosphate of Lime.

Cod-Liver Oil	8 fluidounces.
Mucilage of Irish Moss (N. F.)	5 "
Phosphate of Calcium	256 grains.
Syrup of Tolu	1 fluidounce.
Alcohol	1 "
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

To the Mucilage of Irish Moss, contained in a suitable vessel, gradually add the Cod-Liver Oil and prepare an emulsion as directed under *Emulsio Olei Morrhuæ.* Triturate the Phosphate of Calcium with the Syrup of Tolu and add this to the emulsion; then add the Alcohol, Flavoring, and enough Water to make *sixteen* (16) *fluidounces.* Mix the whole thoroughly together.

Note.—If any other method of emulsifying the oil is adopted, the Phosphate of Calcium should be triturated with Water, or some other of the liquid constituents, which are added last.

118. EMULSIO OLEI MORRHUÆ CUM EXTRACTO MALTI.

Emulsion of Cod-Liver Oil with Extract of Malt.

Cod-Liver Oil	8 fluidounces.
Mucilage of Dextrin (N. F.)	2 "
Extract of Malt	6 "

To the Mucilage of Dextrin contained in a suitable bottle, add the Extract of Malt, and mix them thoroughly by agitation. Then gradually add the Cod-Liver Oil, first in small portions, agitating each time until the last-added portion is perfectly incorporated.

Note.—Extract of Malt, most suitable for this preparation, should have about the same consistence as Balsam of Peru, at a temperature of 15° C. (59° F.)

119. EMULSIO OLEI MORRHUÆ CUM HYPOPHOSPHITE.

Emulsion of Cod-Liver Oil with Hypophosphite.

Cod-Liver Oil	8 fluidounces.
Mucilage of Irish Moss (N. F.)	5 "
Any Soluble Hypophosphite	128 grains.
Syrup of Tolu	1 fluidounce.
Alcohol	1 "
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

Dissolve the Hypophosphite in the Mucilage of Irish Moss, and emulsify the Cod-Liver Oil with the latter as directed under *Emulsio Olei Morrhuæ*. Then add the Syrup of Tolu, Alcohol, and Flavoring, and finally, enough Water to make *sixteen* (16) *fluidounces*. Mix the whole thoroughly together.

Note.—If another method of emulsifying the oil is adopted, the Hypophosphite should be dissolved in the aqueous portion of the mixture.

If more than one Hypophosphite is directed in combination with Emulsion of Cod-Liver Oil, and no definite quantities of the salts are prescribed, equal parts of the several Hypophosphites may be taken, amounting altogether to 128 grains, for every pint of emulsion.

120. EMULSIO OLEI MORRHUÆ CUM PRUNO VIRCINIANA.

Emulsion of Cod-Liver Oil with Wild Cherry.

Cod-Liver Oil	8 fluidounces.
Mucilage of Irish Moss (N. F.)	5 "
Fluid Extract of Wild Cherry	1 fluidounce.
Syrup of Tolu	1 "
Alcohol	½ "
Flavoring	a sufficient quantity.
Water	enough to make 16 fluidounces.

To the Mucilage of Irish Moss, contained in a suitable bottle, gradually add the Cod-Liver Oil, and prepare an emulsion as directed under *Emulsio Olei Morrhuæ*. Next add the Fluid Extract of Wild Cherry, then the Syrup of Tolu, Alcohol, Flavoring, and enough Water to make *sixteen* (16) *fluidounces*.

Note.—If another method of emulsifying the oil is adopted, the Fluid Extract of Wild Cherry is to be added after the emulsion of the oil is accomplished, if necessary, with omission of a corresponding volume of one of the secondary constituents.

121. EMULSIO OLEI RICINI.

Emulsion of Castor Oil.

I. Irish Moss Emulsion of Castor Oil.

Castor Oil	5 fluidounces.
Mucilage of Irish Moss (N. F.)	5 "
Tincture of Vanilla	180 minims.
Syrup	3 fluidounces.
Water	enough to make 16 fluidounces.

To the Mucilage of Irish Moss, contained in a suitable bottle, add the Castor Oil in divided portions, agitating each time until the last-added portion has been emulsified. Then add the Tincture of Vanilla, the Syrup, and enough Water to make *sixteen* (16) *fluidounces*. Finally, mix the whole thoroughly together.

This emulsion should not be prepared in larger quantity than may be consumed within a short time.

Emulsion of Castor Oil may also be prepared by other methods capable of emulsifying the oil, provided the vehicles and ingredients are compatible with the therapeutic employment of the preparation. In absence of any specific directions of the prescriber, it is recommended that Castor Oil Emulsion be only prepared either by means of Irish Moss, or by means of Acacia.

II. Acacia Emulsion of Castor Oil.

Castor Oil	5 fluidounces.
Acacia, in fine powder	1½ troy ounces.
Tincture of Vanilla	180 minims.
Syrup	3 fluidounces.
Water	enough to make 16 "

Mix the Syrup with *two* (2) *fluidounces* of Water, and triturate the Acacia with the mixture to a smooth paste. Then gradually incorporate with it the Castor Oil. Transfer the mixture to a bottle, add the Tincture of Vanilla, and enough Water to make *sixteen* (16) *fluidounces*. Finally, mix the whole thoroughly together.

This Emulsion should not be prepared in larger quantity than may be consumed within a short time.

122. EMULSIO OLEI TEREBINTHINÆ.

Emulsion of Oil of Turpentine.

Oil of Turpentine	½ fluidounce.
Acacia, in fine powder	30 grains.
Yolk of Egg	one (1)
Aromatic Elixir	½ fluidounce.
Cinnamon Water	enough to make 4 fluidounces.

Triturate the Acacia with the Yolk of Egg, then add the Oil of Turpentine very slowly, continuing the trituration, and finally, add the Water and Aromatic Elixir in the same manner.

Emulsion of Oil of Turpentine, or of any *Volatile Oil*, may also be prepared according to the following general formula:

Volatile Oil	½ fluidounce.
Acacia, in fine powder	120 grains.
Syrup	1 fluidounce.
Water	enough to make 4 fluidounces.

Pour the Volatile Oil into a dry four-ounce bottle, and, having corked the latter, agitate it so that the inner surface may be completely wetted by the Oil. Then add the Acacia, and shake again. Finally add the Syrup, and enough Water to make *four* (4) *fluidounces*, and mix thoroughly by shaking.

Note.—If this general formula is applied to Emulsion of Oil of Turpentine, and a product similar to that obtained by the first formula is desired, the Syrup should be replaced by Aromatic Elixir, and the Water by Cinnamon Water.

If a so-called "Emulsion" of a Volatile Oil is to be made more permanent, this may be accomplished by incorporating with it a small proportion of some bland fixed oil, such as Expressed Oil of Almond. Usually, 1 volume of the fixed oil will be sufficient for 2 volumes of the volatile oil.

In this case, the mixture should be made in a mortar, by trituration.

123. EMULSIO PHOSPHATICA.

Phosphatic Emulsion.

Mistura Phosphatica.

Cod-Liver Oil	4	fluidounces.
Glycerite of Yolk of Egg (U. S. P.)	2½	troy ounces.
Diluted Phosphoric Acid	360	minims.
Oil of Bitter Almond	10	"
Rum, Jamaica	4	fluidounces.
Orange Flower Water . . . . enough to make	16	fluidounces.

To the Glycerite of Yolk of Egg (Glyconin) contained in a suitable bottle, gradually add the Cod-Liver Oil, in small portions at a time, shaking after each addition, until the added portion is emulsified. Then gradually add the Phosphoric Acid, Rum, and Oil of Bitter Almond, incorporating them thoroughly. Finally, add enough Orange Flower Water to make *sixteen* (16) *fluidounces*, and mix the whole thoroughly.

124. EXTRACTA FLUIDA.

Fluid Extracts.

The Fluid Extracts for which formulæ are given in this Formulary, are intended to be of such a strength that *one* (1) *minim* shall represent *one* (1) *grain* of the air-dry, powdered drug.

Note.—The U. S. Pharm. directs that 100 cubic centimeters of fluid extract shall be obtained from 100 grammes of drug. Fluid extracts prepared in this ratio are 5 per cent. weaker than those which are made minim for grain. The difference between the two kinds is not regarded as being of material importance.

General Processes. The Fluid Extracts of this Formulary are to be prepared according to one of the following two general processes, the particular one to be employed being designated in each case.

Process A. The Menstruum contains no Glycerin.

Moisten *sixteen* (16) *troy ounces* of the drug with a sufficient quantity of the prescribed menstruum to render it distinctly damp and to maintain it so after several hours' maceration in a well covered vessel. When the drug has ceased to swell, pack it in a suitable percolator, pour a sufficient quantity of the menstruum on top, and, when the percolate begins to drop from the orifice, close the latter, cover the percolator, and allow the contents to macerate for twenty-four hours. Then permit the percolation to proceed. Receive the first *fourteen* (14) *fluidounces* of the percolate separately and set it aside. Then continue the percolation with the same menstruum until the drug is practically exhausted. Evaporate this second portion—at a temperature sufficiently low to prevent the loss of any important volatile constituent—to a soft extract, and dissolve this in a sufficient quantity of the menstruum so that when this is added to the reserved portion, the product will measure *sixteen* (16) *fluidounces.* Allow the Fluid Extract to stand a few days, or longer, if convenient, and filter, if necessary.

Process B. The Menstruum contains Glycerin.

Moisten *sixteen* (16) *troy ounces* of the drug with a sufficient quantity of Menstruum I (see note) to render it distinctly damp and to maintain it so after several hours' maceration in a well covered vessel. When the drug has ceased to swell, pack it in a suitable percolator and pour the remainder of Menstruum I on top. When this has just disappeared from the surface, follow it by a sufficient quantity of Menstruum II. As soon as the percolate begins to drop from the orifice, close the latter, cover the percolator, and allow the contents to macerate during twenty-four hours. Then permit the percolation to proceed. Receive the first *fourteen* (14) *fluidounces* of the percolate separately and set it aside. Then continue the percolation with Menstruum II, until the drug is practically exhausted. Evaporate this second portion—at a temperature sufficiently low to prevent the loss of any important volatile constituent—to a soft extract, and dissolve this in a sufficient quantity of Menstruum II, so that when this is added to the reserved portion, the product will measure *sixteen* (16) *fluidounces.* Allow the Fluid Extract to stand a few days, or longer, if convenient, and filter, if necessary.

Note.—"Menstruum I" and "Menstruum II" denote the several liquids which will be directed for preparing certain Fluid Extracts. Compare, for instance, Nos. 138, 140, 141.

When it is desired to avoid the use of heat in the preparation of any Fluid Extract, a method of *Fractional Percolation* may be employed, for which directions are given below.

This method involves the use of only *one* kind of menstruum, even in the case of drugs for which two different successive menstrua (I and II) are prescribed in this Formulary. In the case of the latter, a sufficient quantity of Menstruum I should be prepared to serve throughout the process.

Fractional Percolation.—Take of the drug, in powder of the prescribed fineness, *sixteen* (16) *troy ounces*, and divide this into three portions, of *eight* (8), *five* (5) and *three* (3) *troy ounces*, respectively.

Moisten the *first portion* (8 troy ounces) with the menstruum and percolate in the usual manner. Set aside the first *three* (3) *fluidounces* of the percolate, and continue until *twenty-four* (24) *fluidounces* more of percolate have passed, which should be received in several portions, so that the more concentrated will be separate from the last, weak percolate.

Then moisten the *second portion* of the drug (5 troy ounces) with the most concentrated of the percolates received during the preceding operation after the first 3 fluidounces had passed, and percolate again in the usual manner, using the several reserved percolates, successively, as menstrua. Set aside the first *five* (5) *fluidounces*, and continue the percolation until *ten* (10) *fluidounces* more have passed, which should also be received in several portions.

Finally moisten the *third portion* of the drug (3 troy ounces) with the most concentrated of the last reserved percolates, and proceed as directed for the second portion. Collect the first *eight* (8) *fluidounces* separately, and mix them with the two portions previously set aside so as to make *sixteen* (16) *fluidounces* of Fluid Extract.

125. EXTRACTUM ADONIDIS FLUIDUM.

Fluid Extract of Adonis.

From the root of *Adonis vernalis* Linné (Bird's Eye).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol.

126. EXTRACTUM ALETRIDIS FLUIDUM.

Fluid Extract of Aletris.

From the rhizome of *Aletris farinosa* Linné (Stargrass).

Process A (see No. 124).—No. 60 powder.
Menstruum: Diluted Alcohol.

127. EXTRACTUM ANGELICÆ RADICIS FLUIDUM.

Fluid Extract of Angelica Root.

From the root of *Angelica Archangelica* Linné (Angelica).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 3 volumes.
Water, 2 volumes.

128. EXTRACTUM APII GRAVEOLENTIS FLUIDUM.

Fluid Extract of Celery.

From the seed of *Apium graveolens* Linné (Celery).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

129. EXTRACTUM APOCYNI CANNABINI FLUIDUM

Fluid Extract of Apocynum Cannabinum.

From the root of *Apocynum cannabinum* Linné (Canadian Hemp).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

130. EXTRACTUM ARALIÆ RACEMOSÆ FLUIDUM.

Fluid Extract of Aralia Racemosa.

From the root of *Aralia racemosa* Linné (American Spikenard).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

131. EXTRACTUM ARNICÆ FLORUM FLUIDUM.

Fluid Extract of Arnica Flowers.

From the flower heads of *Arnica montana* Linné (Arnica).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

132. EXTRACTUM ASCLEPIADIS TUBEROSÆ FLUIDUM.

Fluid Extract of Asclepias Tuberosa.

From the root of *Asclepias tuberosa* Linné (Pleurisy Root).

Process A (see No. 124).—No. 60 powder.
Menstruum: Diluted Alcohol.

133. EXTRACTUM ASPIDOSPERMATIS FLUIDUM.

Fluid Extract of Aspidosperma.

From the bark of *Aspidosperma Quebracho* Schlechtendahl (Quebracho).

Process B (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 9 fluidounces.
Water, 5 fluidounces.
Glycerin, 2 fluidounces.

134. EXTRACTUM BERBERIDIS VULGARIS FLUIDUM.

Fluid Extract of Berberis Vulgaris.

From the bark of the root of *Berberis vulgaris* Linné (Barberry).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 3 volumes.
Water, 2 volumes.

135. EXTRACTUM BOLDI FLUIDUM.

Fluid Extract of Boldo.

From the leaves of *Peumus Boldus* Molina (Boldo).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

136. EXTRACTUM BUCHU FLUIDUM COMPOSITUM.

Compound Fluid Extract of Buchu.

Buchu	10 troy ounces.
Cubeb	2 " "
Juniper	2 " "
Uva Ursi	2 " "

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

137. EXTRACTUM CALENDULÆ FLUIDUM.

Fluid Extract of Calendula.

From the flowering herb of *Calendula officinalis* Linné (Marigold).

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

138. EXTRACTUM CAMELLIÆ FLUIDUM.

Fluid Extract of Camellia.

From the commercial dried leaves of *Camellia Thea* Link (Tea).

Process B (see No. 124).—No. 40 powder.
Menstruum I: Alcohol, 4 fluidounces.
Water, 11 fluidounces.
Glycerin, 1 fluidounce.
Menstruum II: Alcohol, 1 volume.
Water, 3 volumes.

Note.—It is recommended that the best quality of commercial black tea, preferably "Formosa Oolong," be employed for this preparation.

139. EXTRACTUM CAULOPHYLLI FLUIDUM.

Fluid Extract of Caulophyllum.

From the rhizome and rootlets of *Caulophyllum thalictroides* Michaux (Blue Cohosh).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 3 volumes.
Water, 1 volume.

140. EXTRACTUM COFFEÆ VIRIDIS FLUIDUM.

Fluid Extract of Green Coffee.

From the commercial, unroasted seeds of *Coffea arabica* Linné (Coffee).

Process B (see No. 124).—No. 20 powder.
Menstruum I: Alcohol, 4 fluidounces.
Water, 11 fluidounces.
Glycerin, 1 fluidounce.
Menstruum II: Alcohol, 1 volume.
Water, 3 volumes.

Note.—It is recommended that the best quality of either of the commercial varieties known as "Java," or "Mocha" Coffee be employed for this preparation.

141. EXTRACTUM COFFEÆ TOSTÆ FLUIDUM.

Fluid Extract of Roasted Coffee.

From the commercial, roasted seeds of *Coffea arabica* Linné (Coffee).

Process B (see No. 124).—No. 20 powder.
Menstruum I: Alcohol, 4 fluidounces.
Water, 11 fluidounces.
Glycerin, 1 fluidounce.
Menstruum II: Alcohol, 1 volume.
Water, 3 volumes.

Note.—See the note to the preceding.

142. EXTRACTUM CONVALLARIÆ FLORUM FLUIDUM.

Fluid Extract of Convallaria Flowers.

From the flowers of *Convallaria majalis* Linné (Lily of the Valley).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

143. EXTRACTUM CONVALLARIÆ RADICIS FLUIDUM.

Fluid Extract of Convallaria Root.

From the rhizome of *Convallaria majalis* Linné (Lily of the Valley).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 3 volumes.
Water, 2 volumes.

144. EXTRACTUM COPTIS FLUIDUM.

Fluid Extract of Coptis.

From the rhizome and rootlets of *Coptis trifolia* Salisbury (Goldthread).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

145. EXTRACTUM CORNUS CIRCINATÆ FLUIDUM.

Fluid Extract of Cornus Circinata

From the bark of *Cornus circinata* L'Héritier (Green Osier).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

146. EXTRACTUM CORYDALIS FLUIDUM.

Fluid Extract of Corydalis.

From the tubers of *Dicentra canadensis* De Candolle (Turkey Corn).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 3 volumes.
Water, 1 volume.

147. EXTRACTUM COTO FLUIDUM.

Fluid Extract of Coto.

From Coto bark, derived from an undetermined tree, native of tropical South America.

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 9 volumes.
Water, 1 volume.

148. EXTRACTUM ERIODICTYI FLUIDUM.

Fluid Extract of Eriodictyon.

From the leaves of *Eriodictyon californicum* Bentham (Mountain Balm; Yerba Santa).

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 3 volumes.
Water, 1 volume.

149. EXTRACTUM FERRI POMATUM.

Ferrated Extract of Apples.

Ferri Malas Crudus. Crude Malate of Iron.

Iron, in the form of fine, bright wire, and cut	1 part.
Ripe Sour Apples	50 parts.
Water	a sufficient quantity.

Convert the Sour Apples into a homogeneous pulp by pounding or grinding, and express the liquid portion. Then mix the latter with the Iron in an enameled or porcelain vessel, macerate for forty-eight hours, and then apply the heat of a water-bath, until no more bubbles of gas are given off, adding a little water from time to time to make up any loss by evaporation. Dilute the liquid with Water to make it weigh *fifty* (50) *parts*, and set it aside for a few days. Then filter, and evaporate the filtrate in the before-mentioned vessel to a thick extract, which should be greenish-black, and should yield a clear solution with water.

Note.—This preparation is inserted here with the title under which it is contained in the German Pharmacopœia. In some others it is called more correctly, *Extractum Pomi* (or *Pomorum*) *Ferratum*.

150. EXTRACTUM FUCI FLUIDUM.

Fluid Extract of Fucus.

From the thallus of *Fucus vesiculosus* Linné (Bladder-wrack)

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 3 volumes.
Water, 1 volume.

151. EXTRACTUM GLYCYRRHIZÆ DEPURATUM.

Purified Extract of Glycyrrhiza.

Purified Extract of Liquorice.

Extract of Glycyrrhiza, in sticks.
Water, each . . . . a sufficient quantity.

Put a layer of well-washed rye-straw over the bottom of a keg or other suitable tall vessel. Then put a single layer of sticks of Extract of Glycyrrhiza, broken into coarse pieces, over it. Continue to put in alternate layers of straw and Extract of Glycyrrhiza until the vessel is full or the whole of the Extract has been disposed of. Fill the vessel with cold Water, and allow it to remain for three days. Then draw off the solution which has formed, by means of a faucet, or siphon, or otherwise, refill the vessel with cold Water, and proceed as before. Mix the several solutions obtained, allow any suspended matter to subside, decant the clear solution, and strain the remainder without pressure. Finally evaporate the liquid on a water-bath to the consistence of a pilular extract.

Note.—Purified Extract of Glycyrrhiza should not be confounded with the officinal Pure Extract of Glycyrrhiza (*Extractum Glycyrrhizæ Purum*).

152. EXTRACTUM HELIANTHEMI FLUIDUM.

Fluid Extract of Helianthemum.

From the herb of *Helianthemum canadense* Michaux (Frost-wort).

Process A (see No 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

153. EXTRACTUM HUMULI FLUIDUM.

Fluid Extract of Hops.

From the strobiles of *Humulus Lupulus* Linné (Hops).

Process A (see No. 124).—No. 20 powder.
Menstruum: Alcohol, 5 volumes.
Water, 3 volumes.

154. EXTRACTUM HYDRANGEÆ FLUIDUM.

Fluid Extract of Hydrangea.

From the root of *Hydrangea arborescens* Linné (Seven Barks).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 3 volumes.
Water, 2 volumes.

155. EXTRACTUM JALAPÆ FLUIDUM.

Fluid Extract of Jalap.

From the tuberous root of *Exogonium Purga* Bentham (Jalap).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol.

156. EXTRACTUM JUGLANDIS FLUIDUM.

Fluid Extract of Juglans.

From the inner bark of the root of *Juglans cinerea* Linné (Butternut).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

157. EXTRACTUM JUNIPERI FLUIDUM.

Fluid Extract of Juniper.

From the fruit of *Juniperus communis* Linné (Juniper).

Process A (see No. 124).—No. 10 powder.
Menstruum: Diluted Alcohol.

158. EXTRACTUM KAVÆ FLUIDUM.

Fluid Extract of Kava.

From the root of *Piper methysticum* Forster (Kava; Kava-kava; Ava).

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 3 volumes.
Water, 2 volumes.

159. EXTRACTUM LAPPÆ FLUIDUM.

Fluid Extract of Lappa.

From the root of *Lappa officinalis* Albioni (Burdock).

Process A (see No. 124).—No. 40 powder.

Menstruum: Diluted Alcohol.

160. EXTRACTUM MALTI FLUIDUM.

Fluid Extract of Malt.

Malt	16 troy ounces.
Alcohol, Water, each	a sufficient quantity.

Reduce the Malt to a coarse powder, not finer than No. 20. Moisten it with *eight* (8) *fluidounces* of a mixture of *one* (1) *volume* of Alcohol and *three* (3) *volumes* of Water, and set it aside, well-covered, until it has ceased to swell. Then mix it with as much of the menstruum as it will take up without dripping, pack it uniformly, but without pressure, in a percolator, and add enough of the before-mentioned menstruum to cover it. When the liquid begins to drop from the orifice, close the latter, and allow the contents to macerate during twenty-four hours, adding from time to time more menstruum, if necessary, to keep the malt just covered. Then remove the cork and allow the percolation to proceed until the percolate weighs *twelve* (12) *troy ounces*. Set this aside, well-corked, until any suspended matters have been deposited. Then decant the clear liquid and preserve it for use.

Note.—The product thus obtained may be regarded as being practically equivalent to the drug in the proportion of minim for grain, the apparent excess of dissolved matters present in the first portions of the percolate being about offset by the soluble matters still remaining in the drug, when the percolation is interrupted.

161. EXTRACTUM MENYANTHIS FLUIDUM.

Fluid Extract of Menyanthes.

From the leaves of *Menyanthes trifoliata* Linné (Buckbean.—Trifolium fibrinum *Germ. Pharm.*)

Process A (see No. 124).—No. 20 powder.

Menstruum: Diluted Alcohol.

162. EXTRACTUM PETROSELINI RADICIS FLUIDUM.

Fluid Extract of Parsley Root.

From the root of *Petroselinum sativum* Hoffmann (Parsley).

Process A (see No. 124).—No. 40 powder.

Menstruum: Diluted Alcohol.

163. EXTRACTUM PHYTOLACCÆ FLUIDUM.

Fluid Extract of Phytolacca.

From the root of *Phytolacca decandra* Linné (Poke Root).

Process A (see No. 124).—No. 60 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

164. EXTRACTUM QUILLAJÆ FLUIDUM.

Fluid Extract of Quillaja.

From the bark of *Quillaja Saponaria* Molina (Soap-Bark).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

165. EXTRACTUM RHAMNI PURSHIANÆ FLUIDUM.

Fluid Extract of Rhamnus Purshiana.

From the bark of *Rhamnus Purshiana* De Candolle (Cascara Sagrada).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

166. EXTRACTUM RHEI FLUIDUM AROMATICUM.

Aromatic Fluid Extract of Rhubarb.

Rhubarb	12	troy ounces.
Cinnamon	2½	" "
Cloves	2½	" "
Nutmeg	1⅛	troy ounce.

Reduce the drugs to a moderately coarse (No. 40) powder, and prepare a Fluid Extract, using the below-mentioned Process and Menstruum:

Process A (see No. 124).
Menstruum: Diluted Alcohol.

Note.—If 1 fluidounce of this preparation is mixed with 15½ fluidounces of Syrup, the product will be practically identical with the officinal *Syrupus Rhei Aromaticus.*

167. EXTRACTUM SCOPARII FLUIDUM.

Fluid Extract of Scoparius.

From the tops of *Sarothamnus Scoparius* Koch (Broom).

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

168. EXTRACTUM SENNÆ FLUIDUM DEODORATUM.

Deodorized Fluid Extract of Senna.

Senna, in No. 60 powder	16 troy ounces.
Alcohol,	
Water, each	a sufficient quantity.

Moisten the Senna with *six* (6) *fluidounces* of Alcohol, pack it firmly in a percolator, and percolate it with Alcohol until it is practically exhausted by this menstruum. The alcoholic percolate thus obtained is rejected, and the alcohol may be recovered therefrom by distillation. Then take out the moist powder, dry it, and prepare a Fluid Extract by the Process and Menstruum below-mentioned:

Process A (see No. 124).
Menstruum: Alcohol, 1 volume.
Water, 1 volume.

169. EXTRACTUM STERCULIÆ FLUIDUM.

Fluid Extract of Sterculia.

From the seeds of *Sterculia acuminata* R. Brown (Cola; Kola).

Process B (see No. 124).—No. 20 powder.
Menstruum I: Alcohol, 4 fluidounces.
Water, 11 fluidounces.
Glycerin, 1 fluidounce.
Menstruum II: Alcohol, 1 volume.
Water, 3 volumes.

170. EXTRACTUM STILLINGIÆ FLUIDUM COMPOSITUM.

Compound Fluid Extract of Stillingia.

Stillingia	4 troy ounces.
Corydalis (root)	4 " "
Iris	2 " "
Sambucus	2 " "
Chimaphila	2 " "
Coriander	1 troy ounce.
Xanthoxylum Berries	1 " "

Reduce the drugs to a moderately coarse (No. 40) powder, and prepare a Fluid Extract in the usual manner, by the Process and Menstrua below mentioned.

Process B (see No. 124).
Menstruum I: Alcohol, 8 fluidounces.
Glycerin, 4 fluidounces.
Water, 4 fluidounces.
Menstruum II: Diluted Alcohol.

171. EXTRACTUM TRILLII FLUIDUM.

Fluid Extract of Trillium.

From the rhizome of *Trillium erectum* Linné, and other species of *Trillium* (Bethroot).

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 3 volumes.
Water, 2 volumes.

172. EXTRACTUM TURNERÆ FLUIDUM.

Fluid Extract of Turnera.

From the leaves of *Turnera microphylla* De Candolle and other species of *Turnera* (Damiana).

Process A (see No. 124).—No. 20 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

173. EXTRACTUM URTICÆ FLUIDUM.

Fluid Extract of Urtica.

From the root of *Urtica dioica* Linné (Nettle).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

174. EXTRACTUM VERBASCI FLUIDUM.

Fluid Extract of Verbascum.

From the leaves and flowers of *Verbascum Thapsus* Linné (Mullein).

Process A (see No. 124).—No. 20 powder.
Menstruum: Diluted Alcohol.

175. EXTRACTUM VERBENÆ FLUIDUM.

Fluid Extract of Verbena.

From the root of *Verbena hastata* Linné (Vervain).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

176. EXTRACTUM VIBURNI OPULI FLUIDUM.

Fluid Extract of Viburnum Opulus.

From the bark of *Viburnum Opulus* Linné (Cramp Bark).

Process A (see No. 124).—No. 40 powder.
Menstruum: Alcohol, 2 volumes.
Water, 1 volume.

177. EXTRACTUM ZEÆ FLUIDUM.

Fluid Extract of Zea.

Extractum Stigmatum Maydis Fluidum. Fluid Extract of Corn Silk.

From the stigmata of *Zea Mays* Linné (Indian Corn).

Process A (see No. 124).—No. 40 powder.
Menstruum: Diluted Alcohol.

178. FERRI ET QUININÆ CITRAS EFFERVESCENS.

Effervescent Citrate of Iron and Quinine.

Citrate of Iron and Quinine	20 parts.
Bicarbonate of Sodium	600 "
Tartaric Acid	540 "
Sugar, in very fine powder	620 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of the above compound represent 1 grain of Citrate of Iron and Quinine.

179. FERRI HYPOPHOSPHIS.

Hypophosphite of Iron.

Ferric Hypophosphite.

Sulphate of Iron and Ammonium (U. S. P.), in perfect crystals	77 parts.
Hypophosphite of Sodium	51 "
Distilled Water	a sufficient quantity.

Dissolve the Sulphate of Iron and Ammonium in *three hundred* (300) *parts*, and the Hypophosphite of Sodium in *one hundred* (100) *parts* of Distilled Water, and, if necessary, filter each solution. Then mix them, and stir thoroughly; after a short time transfer the mixture to a close linen or muslin strainer, and wash the precipitate with Distilled Water, until the washings run off tasteless. Transfer the strainer to a warm place and, when the contents are dry, preserve them for use.

Hypophosphite of Iron (ferric) may also be prepared in the following manner:

Hypophosphite of Calcium	1 part.
Solution of Chloride of Iron (U. S. P.)	
Distilled Water	each, a sufficient quantity.

Dissolve the Hypophosphite of Calcium in *twelve* (12) *parts* of Distilled Water, and filter the solution. To this add Solution of

Chloride of Iron, in small portions, stirring well each time and allowing the precipitate to subside before adding a fresh portion. Toward the end, remove a small quantity of the clear supernatant liquid, add to it some Solution of Chloride of Iron diluted with about *ten* (10) *times* its volume of Water, and observe whether any turbidity occurs either at once or after a few minutes. If it remains clear, the precipitation may be regarded as complete. Then transfer the mixture to a close linen or muslin strainer, and wash the precipitate with Distilled Water, until the washings run off tasteless. Transfer the strainer to a warm place and, when the contents are dry, preserve them for use.

Note.—Hypophosphite of Iron is rendered soluble in water by mixing it with about an equal weight of citrate of potassium, or some other alkali citrate. Theoretically, 100 parts of Sulphate of Iron and Ammonium will yield 51.9 parts, and 100 parts of Hypophosphite of Calcium will yield 85.3 parts of dry Hypophosphite of Iron (ferric).

180. FERRI PHOSPHAS EFFERVESCENS.

Effervescent Phosphate of Iron.

Phosphate of Iron (U. S. P. 1880)	40 parts.
Bicarbonate of Sodium	600 "
Tartaric Acid	540 "
Sugar, in very fine powder	620 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of the above compound represent 2 grains of Phosphate of Iron.

181. GELATINUM CHONDRI.

Irish Moss Gelatin.

Irish Moss	1 part.
Water	a sufficient quantity.

Wash the Irish Moss with cold Water, then place it in a suitable vessel, add *fifty* (50) *parts* of hot Water, and heat it on a boiling water-bath, for fifteen minutes, frequently stirring. Strain the decoction, while hot, through a strong muslin strainer; return the strained, mucilaginous liquid to the water-bath, evaporate it to a semi-fluid consistence. then transfer it to shallow, flat-bottomed trays, and evaporate it at a temperature not exceeding 90° C (194° F.), so that the Gelatin may become detached in scales.

Note.—Irish Moss Gelatin thus prepared furnishes a Mucilage of Irish Moss which is opaque, like that made directly from the Moss itself. It may be prepared so as to yield a transparent mucilage by following the plan pointed out in the *Note* to *Mucilago Chondri.*

182. GLYCERITUM ACIDI TANNICI.

Glycerite of Tannic Acid.

Tannic Acid	1 part.
Glycerin	5 parts.

Mix them in a porcelain or enamelled capsule, avoiding contact with metallic utensils, and apply the heat of a water-bath, until complete solution has taken place. Then transfer the solution to bottles.

Note.—The product will be practically identical in strength with the preparation officinal in the U. S. P. of 1870, which was directed to be made from 1 troy ounce of Tannic Acid and 4 fluidounces of Glycerin.

183. GLYCERITUM BISMUTHI.

Glycerite of Bismuth.

Liquor Bismuthi Concentratus. Concentrated Solution of Bismuth.

Subnitrate of Bismuth	1480 grains.
Nitric Acid	4 troy ounces.
Citric Acid	1200 grains.
Water of Ammonia	a sufficient quantity.
Glycerin	8 fluidounces.
Water	enough to make 16 "

Dissolve the Subnitrate of Bismuth in the Nitric Acid mixed with an equal volume of Water. Add the Citric Acid previously dissolved in *four* (4) *fluidounces* of Water. Divide the solution into two equal portions. To one portion add Water of Ammonia until the precipitate first formed is redissolved, and then dilute with Water to *eight* (8) *pints*. To this add the reserved portion, stirring constantly. Let the mixture stand about six hours, then transfer it to a paper filter, inside of a muslin strainer, both being folded together. Wash the precipitate with Water, until it is free from Nitric Acid, and by gentle pressure remove as much of the Water as possible. Dissolve the precipitate in a sufficient quantity of Water of Ammonia, evaporate the solution on the water-bath, in a tared capsule, to *eight* (8) *troy ounces*, then transfer it to a graduate, allow it to cool and wash the capsule with a little Water so as to make the whole volume of liquid measure *eight* (8) *fluidounces*. Finally add the Glycerin, and filter, if necessary.

Glycerite of Bismuth, when required for immediate use, may also be prepared as follows:

Citrate of Bismuth and Ammonium	2048 grains.
Stronger Water of Ammonia	a sufficient quantity.
Glycerin	8 fluidounces.
Water	enough to make 16 fluidounces.

Triturate the Citrate of Bismuth and Ammonium with *six* (6) *fluidounces* of Water and *four* (4) *fluidounces* of Glycerin, and add to it gradually just enough Stronger Water of Ammonia to dissolve the salt, and to produce a neutral solution. Then add the remainder of the Glycerin and enough Water to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 16 grains of Citrate of Bismuth and Ammonium.

Note.—When this preparation is directed as an ingredient in other preparations, which are required to be filtered when completed, it may be added to them without previous filtration.

If Glycerite of Bismuth should at any time deposit a precipitate, this may be redissolved by the addition of just sufficient Stronger Water of Ammonia.

184. GLYCERITUM BOROGLYCERINI.

Glycerite of Boroglycerin.

Glycerite of Glyceryl Borate. Solution of Boroglyceride.

Boric Acid, in powder	62 parts.
Glycerin	enough to make 200 "

Heat *ninety-two* (92) *parts* of Glycerin, in a tared porcelain capsule to a temperature not exceeding 150° C. (302° F.), and add the Boric Acid, in portions, constantly stirring. When all is added and dissolved, continue the heat at the same temperature, frequently stirring, and breaking up the film which forms on the surface. When the mixture has been reduced to the weight of *one hundred* (100) *parts*, add to it *one hundred* (100) *parts* of Glycerin, mix thoroughly, and transfer it to suitable vessels.

Two parts, by weight, of this preparation represent 1 part of solid Boroglycerin.

Note.—The product, which is a clear, viscid liquid, is more readily soluble in, and miscible with, other liquids than the solid Boroglycerin (see *Boroglycerinum.*)

185. GLYCERITUM HYDRASTIS.

Glycerite of Hydrastis.

Hydrastis, in fine powder	16 troy ounces.
Glycerin	8 fluidounces.
Alcohol	a sufficient quantity.
Water	enough to make 16 fluidounces.

Moisten the Hydrastis with *six* (6) *fluidounces* of Alcohol, pack it firmly in a percolator, and percolate with Alcohol until the Hydrastis is practically exhausted. To the percolate add *four* (4) *fluidounces* of Water, and then remove the Alcohol by evaporation or distillation. After the Alcohol is driven off, add enough Water to the residue to make it measure *eight* (8) *fluidounces*, set it aside for twenty-four hours, then filter, pass enough Water through the filter to make the filtrate measure *eight* (8) *fluidounces*, and lastly add the Glycerin.

186. GLYCERITUM PEPSINI.

Glycerite of Pepsin.

Pepsin (N.F.)	640 grains.
Hydrochloric Acid	80 minims.
Purified Talcum	120 grains.
Glycerin	8 fluidounces.
Water . . . . enough to make	16 fluidounces.

Mix the Pepsin with *seven* (7) *fluidounces* of Water and the Hydrochloric Acid, and agitate until solution has been effected. Then incorporate the Purified Talcum with the liquid, filter, returning the first portions of the filtrate until it runs through clear, and pass enough Water through the filter to make the filtrate measure *eight* (8) *fluidounces*. To this add the Glycerin, and mix.

Each fluidrachm represents 5 grains of Pepsin (*N. F.*).

Note.—For filtering the aqueous solution of Pepsin first obtained by the above formula, as well as for filtering other liquids of a viscid character, a filter paper of loose texture (preferably that known as "Textile Filtering Paper"), or a layer of absorbent cotton placed in a funnel, or percolator, should be employed.

187. GLYCERITUM PICIS LIQUIDÆ.

Glycerite of Tar.

Tar	1 troy ounce.
Carbonate of Magnesium	2 troy ounces.
Glycerin	4 fluidounces.
Alcohol	2 "
Water . . . . enough to make	16 "

Upon the Tar, contained in a mortar, pour *three* (3) *fluidounces* of cold Water, stir them thoroughly together, and pour off the Water. Repeat this once or twice, until the Water only feebly reddens blue litmus-paper. Now triturate the washed Tar with the Alcohol, gradually incorporate the Carbonate of Magnesium and Glycerin, and lastly, *ten* (10) *fluidounces* of Water. Pour the mixture upon a filter of loose texture spread over a piece of straining muslin, and, after the liquid portion has passed through, wash the residue on the filter with Water, until the whole filtrate measures *sixteen* (16) *fluidounces*.

Note.—Regarding filters of loose texture, see the Note to No. 186.

188. GLYCERITUM TRAGACANTHÆ.

Glycerite of Tragacanth.

Tragacanth, in fine powder	2 troy ounces.
Glycerin	12½ fluidounces.
Water	3 fluidounces.

Triturate the Tragacanth with the Glycerin in a mortar, add the Water, and continue the trituration, until a homogeneous, thick paste results.

Note.—The *Glycerinum Tragacanthæ* of the British Pharm. is prepared by mixing 3 troy ounces of Tragacanth with 12 fluidounces of Glycerin in a mortar, adding 2 fluidounces of Water, and triturating until a translucent, homogeneous jelly is formed.

Mucilago Tragacanthæ of the U. S. Pharm. (1880) is made by mixing 18 parts of Glycerin with 76 parts of Water, heating the mixture to boiling, adding 6 parts of Tragacanth, macerating for twenty-four hours, then adding Water to make 100 parts, beating it to a uniform consistence, and straining.

Unguentum Glycerini of the German Pharm. is prepared by triturating 1 part of powdered Tragacanth with 5 parts (by weight) of Alcohol (of about 91%), then adding 50 parts of Glycerin, and heating on a steam-bath.

189. GOSSYPIUM STYPTICUM.

Styptic Cotton.

Purified Cotton,
Solution of Chloride of Iron,
Glycerin,
Water . . . . each, a sufficient quantity

Mix the liquids in the proportion of *five* (5) *parts* of the Iron Solution, *one* (1) *part* of Glycerin, and *four* (4) *parts* of Water, in such quantities that the Purified Cotton shall be completely immersed in the liquid when gently pressed. Allow the Cotton to remain in the liquid one hour, then remove it, press it, until it has been brought to *twice* its original weight, spread it out in thin layers, in a warm place, protected from dust and light, and when it is sufficiently dry, transfer it to well-closed receptacles.

190. INFUSUM GENTIANÆ COMPOSITUM FORTIUS.

Stronger Compound Infusion of Gentian.

Gentian	2 troy ounces.
Coriander	½ troy ounce.
Bitter Orange Peel	½ " "
Diluted Alcohol . . . . . enough to make	16 fluidounces.

Reduce the drugs to a moderately coarse (No. 40) powder, moisten it with Diluted Alcohol, pack it in a percolator, and percolate with Diluted Alcohol, until *sixteen* (16) *fluidounces* are obtained.

Note.—When *Infusum Gentianæ Compositum* is prescribed, mix 1 volume of this preparation with 3 volumes of water.

191. INFUSUM ROSÆ COMPOSITUM.

Compound Infusion of Rose.

Red Rose	96 grains.
Diluted Sulphuric Acid	70 minims.
Sugar	300 grains.
Boiling Water	16 fluidounces

Pour the Boiling Water upon the Rose in a glass or porcelain vessel, add the Acid, cover the vessel, and macerate for an hour. Then dissolve the Sugar in the liquid and strain.

192. IODOFORMUM AROMATISATUM.

Aromatized Iodoform.

Deodorized Iodoform.

Iodoform	25 parts.
Cumarin	1 part.

Mix them intimately by trituration.

Note.—Should cumarin not be available, or should it be objectionable to the patient, the odor of Iodoform may also be more or less masked by many essential oils, for instance those of peppermint, cloves, cinnamon, citronella, bergamot, sassafras, eucalyptus, etc. Another efficient covering agent is freshly-roasted, and powdered coffee.

The odor of Iodoform may be removed from the hands or any utensils which it has come in contact with, by washing them with an aqueous solution of tannic acid.

193. LAC FERMENTATUM.

Fermented Milk.

Kumyss.

Cow's Milk, fresh	32 fluidounces.
Yeast, semi-liquid	60 minims.
Sugar	1 troy ounce.

Dissolve the Sugar in the Milk, contained in a strong bottle, add the Yeast, cork the bottle securely and keep it at a temperature between 23° and 32° C. (75° to 90° F.), for six hours; then transfer it to a cold place.

194. LINIMENTUM ACONITI ET CHLOROFORMI.

Liniment of Aconite and Chloroform.

Tincture of Aconite	2 fluidounces.
Chloroform	2 "
Soap Liniment	12 "

Mix them.

195. LINIMENTUM AMMONII IODIDI.

Liniment of Iodide of Ammonium.

Iodine	30	grains.
Oil of Rosemary	110	minims.
Oil of Lavender	110	"
Camphor	220	grains.
Water of Ammonia	1¾	fluidounces.
Alcohol	enough to make 16	"

Dissolve the Iodine, the Oils and the Camphor, in *twelve* (12) *fluidounces* of Alcohol, then add the Water of Ammonia, and lastly, enough Alcohol to make *sixteen* (16) *fluidounces.*

Note.—On standing, the liquid will become colorless, and there will, usually, be a slight precipitate, which may be separated by filtration.

196. LINIMENTUM IODI.

Iodine Liniment.

Iodine	900	grains.
Iodide of Potassium	360	"
Glycerin	½	fluidounce.
Water	1	fluidounce.
Alcohol	enough to make 16	fluidounces.

Mix *thirteen* (13) *fluidounces* of Alcohol with the other ingredients, and dissolve the solids by agitation. Then add enough Alcohol to make *sixteen* (16) *fluidounces.*

Note.—The proportion of the ingredients above given yields a product practically identical with that prescribed by the *British Pharmacopœia.*

197. LINIMENTUM OPII COMPOSITUM.

Compound Liniment of Opium.

Canada Liniment.

Tincture of Opium	1½	fluidounces.
Camphor	120	grains.
Alcohol	4	fluidounces.
Oil of Peppermint	180	minims.
Water of Ammonia	6	fluidounces.
Oil of Turpentine	enough to make 16	"

Dissolve the Camphor and the Oil of Peppermint in the Alcohol, then add the Tincture of Opium, Water of Ammonia and Oil of Turpentine. Shake the mixture, whenever any of it is to be dispensed.

Note.—This Liniment will separate a short time after it has been mixed. It may be made somewhat more permanent by adding 180 minims of Tincture of Quillaja (N. F.) to the Water of Ammonia, before adding it to the mixture.

198. LINIMENTUM SAPONATO-CAMPHORATUM.

Camphorated Soap Liniment.

Opodeldoc. Solid Opodeldoc.

White Castile Soap, dried and powdered	1½ troy ounces.
Camphor	½ troy ounce.
Alcohol	20 fluidounces.
Oil of Thyme	30 minims.
Oil of Rosemary	60 "
Stronger Water of Ammonia (U. S. P.)	1 fluidounce.

Introduce the Castile Soap, Camphor, and Alcohol, into a flask or suitable bottle, and apply a gentle heat until solution is effected, taking care that no loss of Alcohol be incurred by evaporation. Filter the liquid, while hot, into another flask or bottle; warm again, if necessary, to render the contents liquid, add the Oils and Stronger Water of Ammonia, and when the whole has been thoroughly mixed, pour it into small dry vials, which should have been previously warmed, and should immediately be corked and cooled.

Note.—The quantity above given is usually divided into 12 vials. Solid Opodeldoc is directed by the *German Pharm.* to be prepared with soap made from animal fats; but pure, white Castile Soap may be used, provided it has been previously deprived of water. The Stronger Water of Ammonia should be of the full strength prescribed by the *U. S. Pharm*

199. LINIMENTUM TEREBINTHINÆ ACETICUM.

Acetic Turpentine Liniment.

Linimentum Album. Stokes' Liniment. St. John Long's Liniment.

Oil of Turpentine	3 fluidounces.
Fresh Egg, albumen and yolk	1 (one)
Oil of Lemon	60 minims.
Acetic Acid (U. S. P.)	300 "
Rose Water	2½ fluidounces.

Triturate or beat the contents of the Fresh Egg with the Oil of Turpentine and the Oil of Lemon in a mortar until they are thoroughly mixed. Then incorporate the Acetic Acid and Rose Water. Shake the mixture, whenever any of it is to be dispensed.

200. LINIMENTUM TIGLII.

Liniment of Croton Oil.

Linimentum Crotonis (Brit. Ph.)

Croton Oil	2 fluidrachms.
Oil of Cajuput	7 "
Alcohol	7 "

Mix them.

201. LINIMENTUM TIGLII COMPOSITUM.

Compound Croton Oil Liniment.

Croton Oil	1 fluidounce.
Oil of Sassafras	1 "
Oil of Turpentine	1 "
Oil of Olive	2 fluidounces.

Mix them.

202. LIQUOR ACIDI PHOSPHORICI COMPOSITUS.

Compound Solution of Phosphoric Acid.

Solution of Acid Phosphates.

Bone Ash, in fine powder	100 parts.
Sulphuric Acid	78 "
Water	400 "

Mix the Bone Ash with *one hundred* (100) *parts* of Water, add the Sulphuric Acid, diluted with *two hundred* (200) *parts* of Water, and mix thoroughly with a porcelain or glass stirrer. Now add the remainder of the Water and set the mixture aside for twenty-four hours, stirring occasionally. Then transfer the mixture to a strong muslin strainer, and subject this to a gradual pressure (avoiding contact with metals), so as to express as much of the liquid as possible. Lastly, filter this through paper.

The specific gravity of this solution is about 1.113 at 15° C. (59° F.)

Note.—The quantity of product obtained depends on the degree of force used in pressing. By strong pressure, about 350 parts may be obtained. If desired, the magma may also be poured in a glass percolator, the neck of which contains a layer of fine quartz sand or asbestos, previously deprived of matters soluble in sulphuric or phosphoric acids. On cautiously pouring water on top, so as not to mix it with the magma, the acid solution will be displaced. But the percolation must be interrupted as soon as the specific gravity of the percolate begins to fall below 1.113. The Sulphuric Acid used in this preparation may be the commercial variety, provided it is free from arsenic, and of a specific gravity not less than 1.830.

203. LIQUOR ALUMINII ACETATIS.

Solution of Acetate of Aluminium.

Sulphate of Aluminium, crystallized	30 parts.
Acetic Acid (U. S. P.)	30 "
Carbonate of Calcium	13 "
Water	100 "

Dissolve the Carbonate of Calcium in the Acetic Acid mixed with *twenty* (20) *parts* of Water, and the Sulphate of Aluminium in *eighty* (80) *parts* of Water. Mix the two solutions, and allow the mixture to stand for twenty-four hours, agitating occasionally. Then pour off the clear solution and filter.

The Solution contains from 7.5 to 8 per cent. of basic Acetate of Aluminium.

Note.—Practically identical with the *Liquor Aluminii Acetici* of the German Pharm.

204. LIQUOR ALUMINII ACETICO-TARTRATIS.

Solution of Acetico-Tartrate of Aluminium.

Alum (U. S. P.)	150	parts.
Carbonate of Sodium	140	“
Glacial Acetic Acid	30	“
Tartaric Acid	27	“
Water . . . enough to make	200	“

Dissolve the Alum and the Carbonate of Sodium, each in *two thousand* (2000) *parts* of Water, mix the solutions, and wash the precipitate, first by decantation, and afterwards on a strainer, until the washings run off tasteless. Allow the precipitate to drain and to shrink in volume by exposure on the strainer. Then transfer it to a tared capsule, add the Glacial Acetic and the Tartaric Acids, and apply heat until solution has been effected. Finally, evaporate the liquid to *two hundred* (200) *parts.*

The product contains about 50 per cent. of dry, so called Acetico-Tartrate of Aluminium.

Note.—The dry salt may be obtained by evaporating the solution.

205. LIQUOR AMMONII ACETATIS CONCENTRATUS.

Concentrated Solution of Acetate of Ammonium.

Acetic Acid (U. S. P.)	16 fluidounces.
Carbonate of Ammonium	a sufficient quantity.
Water . . . enough to make	32 fluidounces.

Neutralize the Acetic Acid with a sufficient quantity of Carbonate of Ammonium, carefully avoiding an excess. Then add enough Water to make the product measure *thirty-two* (32) *fluidounces.*

Note.—The product is about 4 times the strength of the officinal *Liquor Ammonii Acetatis.*

Note.—It is not recommended to keep this solution on hand for the preparation of the officinal *Liquor Ammonii Acetatis*, as this is preferably made freshly when wanted for use. When it is, however, required, or deemed of advantage, to dispense the concentrated solution, it is suggested that it be diluted with Carbonic Acid Water, or be directed to be diluted with this at the time of administration.

206. LIQUOR AMMONII CITRATIS FORTIOR.

Stronger Solution of Citrate of Ammonium.

Citric Acid	9 troy ounces.
Stronger Water of Ammonia, Water, each	a sufficient quantity.

Neutralize the Citric Acid with the Stronger Water of Ammonia, and add enough Water to make *sixteen* (16) *fluidounces.* The solution should be kept in bottles free from lead.

Each fluidrachm contains about 40 grains of Citrate of Ammonium.

Note.—This Solution is apt to take up notable quantities of lead, if kept in bottles made of flint glass.

Liquor Ammonii Citratis (Brit. Pharm.) may be prepared from this solution by mixing 1 volume of it with 4 volumes of Water.

207. LIQUOR BISMUTHI.

Solution of Bismuth.

Liquid Bismuth.

Glycerite of Bismuth	2 fluidounces.
Alcohol	2 “
Distilled Water	12 “

Mix the Glycerite of Bismuth with *twelve* (12) *fluidounces* of Distilled Water, then add the Alcohol.

Solution of Bismuth may also be prepared in the following manner:

Citrate of Bismuth and Ammonium	128 grains.
Alcohol	2 fluidounces.
Water of Ammonia	a sufficient quantity.
Distilled Water	enough to make 16 fluidounces.

Dissolve the Citrate of Bismuth and Ammonium in *thirteen* (13) *fluidounces* of Distilled Water, and allow the solution to stand a short time. Should any insoluble matter have deposited, pour off the clear liquid and add just enough Water of Ammonia to the residue to dissolve it, or to cause it to retain a faint odor of Ammonia. Then filter the united liquids, add the Alcohol, and enough Distilled Water to make *sixteen* (16) *fluidounces.*

This preparation should be freshly made when wanted for use.

Each fluidrachm represents 1 grain of Citrate of Bismuth and Ammonium.

208. LIQUOR BROMI.

Solution of Bromine.

Smith's Solution of Bromine.

Bromine	1 troy ounce.
Bromide of Potassium	½ “ “
Water	4 fluidounces.

Dissolve the Bromide of Potassium in the Water contained in a bottle, add the Bromine, and shake the mixture until this is dissolved. Keep the solution in glass-stoppered vials in a dark place.

Note.—As bromine vapor is very injurious to the respiratory passages and destructive to balances, it is often preferable to take the contents of an original bottle of Bromine—weighing the bottle, both before opening it and after emptying it, in order to ascertain the exact weight of the Bromine contained therein—and then to use a quantity of Bromide of Potassium and of Water proportionate to the quantities above given.

209. LIQUOR CALCIS SULPHURATÆ.

Solution of Sulphurated Lime.

Solution of Oxysulphuret of Calcium. Vleminck's Solution (or *Lotion*).

Lime, freshly slaked	2 parts.
Sublimed Sulphur	3 “
Water . . . enough to make	12 “

Mix the slaked Lime with the Sulphur, and add the mixture gradually to *twenty* (20) *parts* of boiling Water. Then boil the whole, under constant stirring, until it is reduced to *twelve* (12) *parts*, strain, and having allowed the solution to become clear by standing in a well-stoppered bottle, decant the clear brown liquid, and keep it in completely filled and well-stoppered bottles.

210. LIQUOR CARMINI.

Solution of Carmine.

Carmine	1 troy ounce.
Water of Ammonia	6 fluidounces.
Glycerin	6 “
Water . . . enough to make	16 “

Triturate the Carmine to a fine powder in a wedgewood mortar, gradually add the Water of Ammonia, and afterwards the Glycerin, under constant trituration. Transfer the mixture to a porcelain capsule, and heat it upon a water-bath, constantly stirring, until the liquid is entirely free from ammoniacal odor. Then cool, and add enough Water to make *sixteen* (16) *fluidounces*.

Note.—The best quality of Carmine, known in commerce as "No. 40," should be used for this preparation.

211. LIQUOR COCCINEUS.

Cochineal Color.

Cochineal, in No. 50 powder	1 troy ounce.
Carbonate of Potassium	½ “ “
Alum	½ “ “
Bitartrate of Potassium	1 “ “
Glycerin	8 fluidounces.
Alcohol	1 fluidounce.
Water . . . enough to make	16 fluidounces.

Triturate the Cochineal intimately with the Carbonate of Potassium and *eight* (8) *fluidounces* of Water. Then add the Alum and Bitartrate of Potassium successively, heat the mixture to boiling in a capacious vessel, then set it aside to cool, add to it the Glycerin and Alcohol, filter, and pass enough Water through the filter to make *sixteen* (16) *fluidounces*.

212. LIQUOR CUPRI ALKALINUS.

Alkaline Solution of Copper.

Fehling's Solution.

I. *The Copper Solution.*

Sulphate of Copper, pure	34.639 gm.	505 grains.
Distilled Water . . . . . enough to make	500 C.c.	16 fluidounces.

Dissolve the Sulphate of Copper, which before being weighed should have been reduced to powder and pressed between blotting paper, in a sufficient quantity of Distilled Water to produce the volume required by the corresponding formula above given.

II. *The Alkaline Solution.*

Tartrate of Potassium and Sodium	173 gm.	2520 grains.
Soda (U. S. P. 1880)	60 "	2 troy ounces.
Distilled Water . . . . . . enough to make	500 C.c.	16 fluidounces.

Dissolve the Tartrate of Potassium and Sodium and the Soda in a sufficient quantity of Distilled Water to produce the volume required by the corresponding formula above given. Set the mixture aside until the suspended impurities have been deposited; then remove the clear solution with a siphon.

Keep both solutions, separately, in small well-stoppered vials, in a cool and dark place. For use, mix exactly equal volumes of the two solutions, by pouring the copper solution into the alkaline solution.

Note.—The two Solutions should be prepared with cold distilled water, and should be made up to their respective volumes at one and the same temperature. They should also be at the same temperature at the time of mixing. On diluting a small quantity of the mixed Reagent with about three volumes of Distilled Water, and heating the liquid in a test-tube to boiling, it should remain entirely clear, without any trace of discoloration or precipitate.

After the Solutions have been mixed for use, and assuming that they have been prepared and mixed at the average indoor temperature, 10 C.c. of the mixture prepared by metric weight and measure correspond to 0.05 gm. of glucose. Of the mixture prepared by apothecaries' weight and measure, 210 minims correspond to 1 grain of glucose.

213. LIQUOR ELECTROPOEICUS.

Battery Fluid.

A. For the Carbon and Zinc Battery.

I. For ordinary use.

Bichromate of Sodium, in coarse powder	6 troy ounces.
Sulphuric Acid, commercial	6 fluidounces.
Water, cold	48 “

Pour the Sulphuric Acid upon the powdered Bichromate, and stir the mixture occasionally during one hour. Then slowly add the Water.

II. For use with the Galvano-Cautery.

Bichromate of Sodium, in coarse powder	6½ troy ounces.
Sulphuric Acid, commercial	14 fluidounces.
Water, cold	48 “

Proceed in the same manner as directed under No. I.

Note.—Bichromate of Sodium is more soluble than the potassium salt, and its products of decomposition, in the battery, are also more soluble. As it is also much cheaper, it is now preferred in all large electric laboratories. When it cannot be obtained, Bichromate of Potassium may be used in place of it, as heretofore. The two salts may be substituted for each other, weight for weight.

B. For the Leclanché Battery.

Chloride of Ammonium	6 troy ounces.
Water	enough to make 20 fluidounces.

Dissolve the salt in the Water.

214. LIQUOR EXTRACTI GLYCYRRHIZÆ.

Solution of Extract of Glycyrrhiza.

Solution of Extract of Liquorice.

Purified Extract of Glycyrrhiza	a sufficient quantity.
Alcohol	2 fluidounces.
Glycerin	4 “
Water	enough to make 16 “

In a small portion of Purified Extract of Glycyrrhiza, weighed into a tared capsule, determine the amount of water, by drying it to a constant weight. Then take of the Purified Extract a quantity equivalent to *four* (4) *troy ounces* of dry extract, dissolve this, on a water-bath, in *four* (4) *fluidounces* of Water, add the Glycerin, and allow the liquid to cool. Lastly add the Alcohol, and enough Water to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 15 grains of dry Extract of Glycyrrhiza.

215. LIQUOR FERRI HYPOPHOSPHITIS.

Solution of Hypophosphite of Iron.

Solution of Ferric Hypophosphite.

Sulphate of Iron and Ammonium (U. S. P.), in perfect crystals	2464	grains.
Hypophosphite of Sodium	1622	"
Citrate of Potassium	1600	"
Glycerin	2½	fluidounces.
Water enough to make	16	"

Dissolve the Sulphate of Iron and Ammonium, and the Hypophosphite of Sodium, each, in *twenty-four* (24) *fluidounces* of Water, and, if necessary, filter each solution. Then mix them, and stir thoroughly; after a few minutes transfer the resulting magma to a close linen or muslin strainer, and wash the precipitate with about *eight* (8) *fluidounces* of Water. Allow it to drain, and then press it forcibly in the strainer, so as to remove as much of the liquid as possible. Transfer the precipitate from the strainer to a mortar, add to it the Citrate of Potassium, and triturate until a perfectly smooth paste results. Then add the Glycerin, and gradually, while stirring, enough Water to make the solution measure *sixteen* (16) *fluidounces*. Place it for several days in a cold place, if convenient; then pour off the clear solution from any precipitate or crystals that may have formed, and keep the solution in small, completely-filled and well-corked bottles.

Solution of Hypophosphite of Iron (ferric) may also be prepared in the following manner:

Hypophosphite of Iron	1280	grains.
Citrate of Potassium	1622	"
Glycerin	2½	fluidounces.
Water enough to make	16	"

Triturate the Hypophosphite of Iron with *six* (6) *fluidounces* of Water to a perfectly smooth mixture, then add the Citrate of Potassium and Glycerin, and apply a gentle heat, until solution has been effected. Allow the liquid to cool, and add enough Water to make *sixteen* (16) *fluidounces*. Place the solution for several days in a cold place, if convenient; then pour off the clear solution from any precipitate or crystals that may have formed, and keep the solution in small, completely-filled and well-corked bottles.

About 6 minims of this Solution represent 1 grain of Hypophosphite of Iron (ferric).

216. LIQUOR FERRI IODIDI.

Solution of Iodide of Iron.

Iron, in the form of fine, bright, and finely-cut wire . .	3 troy ounces.
Iodine	4718 grains.
Hypophosphorous Acid (N. F.)	180 minims.
Distilled Water . . . . enough to make	16 fluidounces.

Mix the Iron with *twelve* (12) *fluidounces* of Distilled Water in a flask, add about one-half of the Iodine, and agitate continuously until the liquid becomes hot. Then moderate the reaction by placing the flask in cold water, or by allowing cold water to flow over it, meanwhile keeping up the agitation. When the reaction has moderated, add one-half of the remaining Iodine at a time, and carefully moderate the reaction each time, in the manner above directed. Finally, raise the contents of the flask to boiling and filter immediately through moistened pure filtering paper (the point of the filter being supported by a pellet of absorbent cotton) into a bottle containing the Hypophosphorous Acid. When all the liquid has passed, rinse the flask with *one-half* (½) *fluidounce* of boiling Distilled Water, and pass this through the filter. Cork the bottle and set it aside to cool. Finally, add enough Distilled Water to make the product measure *sixteen* (16) *fluidounces*.

Each fluidrachm contains about 45 grains of Iodide of Iron (ferrous).

Note.—On mixing 1 volume of this Solution of Iodide of Iron with 5 volumes of Syrup, the product will contain about 60 grains of Iodide of Iron (ferrous) in each fluidounce, and will be practically identical, measure for measure, but not weight for weight, with the officinal Syrup of Iodide of Iron.

217. LIQUOR FERRI OXYSULPHATIS.

Solution of Oxysulphate of Iron.

Sulphate of Iron	1200 grains.
Nitric Acid	1200 "
Distilled Water . . . . enough to make	16 fluidounces.

Dissolve the Sulphate of Iron in *fifteen* (15) *fluidounces* of boiling Distilled Water, in a flask, gradually add the Nitric Acid, and continue the heat, until the escaping vapors cease to have a nitrous odor. When the reaction is completed, allow the liquid to cool and add enough Distilled Water to make *sixteen* (16) *fluidounces*.

218. LIQUOR FERRI PROTOCHLORIDI.

Solution of Protochloride of Iron.

Solution of Ferrous Chloride.

Iron, in the form of fine, bright, and finely-cut wire . .	1130 grains.
Hydrochloric Acid	10 troy ounces.
Glycerin	4 fluidounces.
Hypophosphorous Acid (N. F.)	60 minims.
Distilled Water . . . . enough to make	16 fluidounces.

To the Iron, contained in a flask, add *six* (6) *fluidounces* of Distilled Water, and the Hydrochloric Acid, and apply a gentle heat, until effervescence ceases. Then raise the liquid to boiling, keep it at this temperature for a short time so that the Iron may be brought into solution as far as possible, filter the solution through a pellet of absorbent cotton placed in the neck of a funnel, and wash the cotton with a little Distilled Water. Evaporate the filtrate, over a boiling water-bath, until crystals begin to form, and the escaping vapors cease to redden, or only slightly affect, moistened blue litmus paper. Now add the Glycerin and the Hypophosphorous Acid, continue the heat, if necessary, until a perfect solution is obtained ; then transfer the liquid to a graduated bottle, allow it to cool, and add enough Distilled Water to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents about 20 grains of Protochloride of Iron (ferrous chloride).

219. LIQUOR HYDRARGYRI ET POTASSII IODIDI.

Solution of Iodide of Mercury and Potassium.

Solution of Iodohydrargyrate of Potassium. Channing's Solution.

Red Iodide of Mercury	72 grains.
Iodide of Potassium	56 "
Distilled Water	enough to make 16 fluidounces.

Dissolve the salts in the Distilled Water.

220. LIQUOR HYPOPHOSPHITUM.

Solution of Hypophosphites.

Hypophosphite of Calcium	256 grains.
Hypophosphite of Sodium	160 "
Hypophosphite of Potassium	128 "
Citric Acid	120 "
Water	enough to make 16 fluidounces.

Dissolve the salts and the Citric Acid in Water so as to make *sixteen* (16) *fluidounces;* filter, if necessary, and pass enough Water through the filter to restore the original volume.

Each fluidrachm contains 2 grains of Hypophosphite of Calcium, 1¼ grain of Hypophosphite of Sodium, and 1 grain of Hypophosphite of Potassium.

221. LIQUOR IODI CARBOLATUS.

Carbolized Solution of Iodine.

Boulton's Solution. French Mixture.

Compound Tincture of Iodine	110 minims.
Carbolic Acid, liquefied by a gentle heat	40 "
Glycerin	2½ fluidounces.
Water	enough to make 16 "

Mix the Glycerin with the Carbolic Acid and Compound Tincture of Iodine, add enough Water to make *sixteen* (16) *fluidounces*, and expose the mixture to sunlight until it has become colorless.

222. LIQUOR IODI CAUSTICUS.

Caustic Solution of Iodine.

Iodine Caustic. Churchill's Iodine Caustic.

Iodine	1 troy ounce.
Iodide of Potassium	2 troy ounces.
Water	4 fluidounces.

Dissolve the Iodide of Potassium and the Iodine in the Water.

223. LIQUOR MAGNESII BROMIDI.

Solution of Bromide of Magnesium.

Diluted Hydrobromic Acid (U. S. P.)	16 fluidounces.
Carbonate of Magnesium	a sufficient quantity.

Saturate the Diluted Hydrobromic Acid with a sufficient quantity (about *one* (1) *troy ounce*) of Carbonate of Magnesium. When effervescence has ceased, filter.

Each fluidrachm contains about 7 grains of Bromide of Magnesium.

224. LIQUOR MORPHINÆ CITRATIS.

Solution of Citrate of Morphine.

Morphine (alkaloid)	16 grains.
Citric Acid	12 "
Cochineal	½ grain.
Alcohol	60 minims.
Distilled Water	enough to make 1 fluidounce.

Triturate the solids with the Alcohol and *seven* (7) *fluidrachms* of Water; filter and pass enough Distilled Water through the filter to make *one* (1) *fluidounce.*

This Solution should not be kept on hand, but prepared only when required.

Each fluidrachm contains 2 grains of Morphine in the form of Citrate.

225. LIQUOR MORPHINÆ HYPODERMICUS.

Hypodermic Solution of Morphine.

Magendie's Solution of Morphine.

Sulphate of Morphine	16 grains.
Distilled Water, warm	1 fluidounce.

Dissolve the Sulphate of Morphine in the warm Distilled Water, and filter the solution through a small pellet of absorbent cotton. When the solution is cold, pass a little Distilled Water through the cotton, if necessary, to make the filtrate measure *one* (1) *fluidounce.* Keep the solution in well-stoppered vials, in a dark place.

Note.—Particular care should be taken in dispensing and labelling this solution, so that it may not be mistaken for the so-called United States Solution of Morphine (*Liquor Morphiæ Sulphatis*, U. S. P. 1870), containing only 1 grain of Sulphate of Morphine in each fluidounce, which is still used in some parts of this country.

The development of fungoid growths or micro-organisms in this and similar solutions used hypodermically may be prevented, or at least greatly retarded, by using Chloroform Water instead of plain Distilled Water as a solvent. This should, however, be done only with the knowledge, or by the direction, of the physician.

Another efficient method to preserve such solutions is, to sprinkle a little Benzoic Acid on the surface of the absorbent cotton through which the solutions are filtered. Or, about 5 grains of Boric Acid may be added to each fluidounce.

226. LIQUOR PANCREATICUS.

Pancreatic Solution.

Pancreatin (N. F.)	128 grains.
Bicarbonate of Sodium	384 “
Glycerin	4 fluidounces.
Compound Spirit of Cardamom (N. F.)	½ fluidounce.
Alcohol	½ “
Purified Talcum	120 grains.
Water	enough to make 16 fluidounces.

Triturate the Pancreatin and the Bicarbonate of Sodium gradually with *ten* (10) *fluidounces* of the Water; add the Alcohol, Compound Spirit of Cardamom and Purified Talcum; mix them thoroughly by shaking, and pour the mixture upon a wetted filter, returning the first portions of the filtrate, until it runs off clear. Wash the filter with enough Water to obtain *twelve* (12) *fluidounces* of filtrate. To this add the Glycerin.

Each fluidrachm represents 1 grain of Pancreatin (*N. F.*).

227. LIQUOR PEPSINI AROMATICUS.

Aromatic Solution of Pepsin.

Pepsin (N. F.)	128 grains.
Oil of Cinnamon	2 drops.
Oil of Pimenta	2 “
Oil of Cloves	4 “
Purified Talcum	120 grains.
Alcohol	½ fluidounce.
Hydrochloric Acid	75 minims.
Glycerin	4 fluidounces.
Water	enough to make 16 “

Mix the Pepsin with *eight* (8) *fluidounces* of Water and the Hydrochloric Acid, and shake the mixture frequently until the Pepsin is dissolved. Then add the Purified Talcum and the Oils, previously dissolved in the Alcohol; mix the whole thoroughly, by agitation, and filter it through a wetted filter, returning the first portions of the liquid until it runs through clear. Pass enough Water through the filter to make the filtrate measure *twelve* (12) *fluidounces.* To this add the Glycerin.

Each fluidrachm represents 1 grain of Pepsin (*N. F.*)

228. LIQUOR PHOSPHORI.

Solution of Phosphorus.

Thompson's Solution of Phosphorus.

Phosphorus	1	grain.
Absolute Alcohol	450	minims.
Spirit of Peppermint	10	"
Glycerin	2	fluidounces.

Dissolve the Phosphorus in *four hundred* (400) *minims* of Absolute Alcohol, in a stoppered vial or test tube, by immersion in a water-bath and frequent agitation, taking care that any loss of Alcohol, by evaporation, be made up from time to time. Allow the solution to become nearly cold, and then add to it the remainder of the Absolute Alcohol and the Glycerin, previously mixed and slightly warmed. Finally add the Spirit of Peppermint. Keep the Solution in a well-stoppered bottle, in the dark.

Each fluidrachm contains about $\frac{1}{24}$ *grain of Phosphorus.*

Note.—This Solution must not be confounded with the Spiritus Phosphori (No. 344) which is not intended to be administered, as such, but is only to be used in compounding the Elixir or other preparations of phosphorus.

The Phosphorus should be perfectly translucent, cut and weighed under water, and quickly dried with filtering paper before being dropped into the alcohol.

229. LIQUOR PICIS ALKALINUS.

Alkaline Solution of Tar.

Tar	4 troy ounces.
Potassa	2 " "
Water	10 fluidounces.

Dissolve the Potassa in the Water. Shake the solution with the Tar so that the latter may be dissolved, and strain the solution through muslin.

230. LIQUOR POTASSÆ CHLORATÆ.

Solution of Chlorinated Potassa.

Liquor Potassæ Chlorinatæ. Javelle Water.

Carbonate of Potassium	58	parts.
Chlorinated Lime (U. S. P.)	80	"
Water . . . enough to make	1000	"

Mix the Chlorinated Lime, contained in a tared flask, with *four* *hundred* (400) *parts* of Water. Dissolve the Carbonate of Potassium in *three hundred* (300) *parts* of boiling Water, and pour the hot solution into the mixture first prepared. Shake the flask well, stopper it, set it aside to cool, and then add enough Water to make the contents weigh *one thousand* (1000) *parts*. Allow the suspended matters to subside, and remove the clear solution by means of a siphon, or by straining through muslin. Keep the product in well-stoppered bottles.

Note.—The Chlorinated Lime should not contain less than 25 per cent. of available chlorine.

231. LIQUOR POTASSII ARSENIATIS ET BROMIDI.

Solution of Arseniate and Bromide of Potassium.

Liquor Arsenii Bromidi. Solution of Bromide of Arsenic. Clemens' Solution.

Arsenious Acid	73 grains.
Bicarbonate of Potassium	73 “
Bromine	117 “
Water	enough to make 16 fluidounces.

Boil the Arsenious Acid with the Bicarbonate of Potassium, and *two* (2) *fluidounces* of Water, until solution is effected. Allow this to cool, add *ten* (10) *fluidounces* of Water, then the Bromine, and afterwards enough Water to make *sixteen* (16) *fluidounces*. Let the mixture stand a few hours, agitating it occasionally, then filter.

This Solution contains an amount of Arsenic in combination, corresponding to about 1 per cent. of Arsenious Acid.

Note.—The title "Solution of Bromide of Arsenic" (*Liquor Arsenii Bromidi*) which is often applied to Clemens' Solution or similar preparations, is a misnomer, since bromide of arsenic cannot exist, as such, in presence of water, but is split up into hydrobromic and arsenious acids. The proportions of the ingredients, in the formula above given, have been adjusted, as closely as practicable, so as to yield definite compounds, viz.: arseniate and bromide of potassium.

In order to prevent injury to the balances by weighing a definite amount of Bromine, the plan suggested in the Note to No. 208 may be applied to this preparation, viz.: to prepare such a quantity of the latter at one time, as will be commensurate to the actual contents of an original vial of Bromine.

232. LIQUOR SACCHARINI.

Solution of Saccharin.

Saccharin	512 grains.
Bicarbonate of Sodium	240 “
Alcohol	4 fluidounces.
Water	enough to make 16 “

Dissolve the Saccharin and the Bicarbonate of Sodium in *ten* (10) *fluidounces* of Water, filter the solution, add the Alcohol to the filtrate, and pass enough Water through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 4 grains of Saccharin.

Note.—The Saccharin directed in the above formula is, properly speaking, "anhydro-ortho-sulphamine-benzoic acid," an artificially prepared member of the so-called aromatic series of organic chemicals. It is a body having feebly acid properties, soluble in about 333 parts of water and in 33 parts of alcohol at 15° C. (59° F.). When neutralized by an alkali, it is quite soluble in water. The Solution of Saccharin is intended to be used for sweetening liquids or solids, when the use of sugar is objectionable, or when a sweet taste is to be imparted to a liquid without increasing its density.

233. LIQUOR SERIPARUS.

Liquid Rennet.

Calves' Rennet, fresh	2 troy ounces.
Chloride of Sodium	360 grains.
Alcohol	4 fluidounces.
Water	16 "

Dissolve the Chloride of Sodium in the Water, add the Alcohol, and macerate in this mixture the Rennet (or the washed mucous membrane of the fresh stomach of a suckling calf), during three days, under frequent agitation. Then filter.

Note.—If this liquid is to be used merely for curdling the milk, without separating the whey as a distinct layer, it should be added to the milk, previously warmed to a temperature of about 35° C. (95° F.), and the mixture should then be set aside undisturbed, until it coagulates. If the whey is to be separated, the Liquid Rennet should be added to the milk while cold, and the mixture heated to about 35° C. (95° F.), but not exceeding 40° C. (104° F.). One part of the liquid should coagulate between 200 and 300 parts of cows' milk.

234. LIQUOR SODII ARSENIATIS, PEARSON.

Pearson's Solution of Arseniate of Sodium.

Arseniate of Sodium, in perfect crystals	1 part.
Distilled Water	enough to make 600 parts.

Dissolve the Arseniate of Sodium in enough Distilled Water to make *six hundred* (600) *parts*, and filter, if necessary.

Pearson's Solution of Arseniate of Sodium may also be prepared as follows:

Solution of Arseniate of Sodium (U. S. P. 1880)	1 part.
Distilled Water	enough to make 10 parts.

Mix the Solution of Arseniate of Sodium with enough Distilled Water to make *ten* (10) *parts*, and filter, if necessary.

This Solution contains about $\frac{1}{10}$ per cent. of anhydrous Arseniate of Sodium.

Note.—This preparation should not be confounded with the *Liquor Sodii*

Arseniatis of U. S. P., which is ten times stronger, than the above preparation. Pearson's Solution is officinal in the French Pharm., under the title *Solut* *d'Arseniate de Soude*, (or *Solution Arsenicale de Pearson*). It is recommended that Pearson's Solution be dispensed only when expressly designated as "Pearson's."

235. LIQUOR SODII BORATIS COMPOSITUS.

Compound Solution of Borate of Sodium.

Dobell's Solution.

Borate of Sodium		120 grains.
Bicarbonate of Sodium		120 "
Carbolic Acid, crystallized		24 "
Glycerin		½ fluidounce.
Water	enough to make	16 fluidounces.

Dissolve the Salts in about *eight* (8) *fluidounces* of Water, then add the Glycerin, and the Carbolic Acid previously liquefied by warming, and lastly, enough Water to make *sixteen* (16) *fluidounces.*

236. LIQUOR SODII CARBOLATIS.

Solution of Carbolate of Sodium.

Phénol Sodique.

Carbolic Acid, crystallized	30 parts.
Soda	2 "
Water	28 "

Dissolve the Soda in the Water, add the Carbolic Acid, and warm gently, until it is dissolved.

This preparation should be made freshly, when wanted for use.

Note.—The formula is based upon that of the Germ. Pharm., (I., 1872).

237. LIQUOR SODII CITRATIS.

Solution of Citrate of Sodium.

Mistura Sodii Citratis. Saturatio. Potio Riveri (Germ. Pharm.).

Citric Acid	150 grains.
Bicarbonate of Sodium	190 "
Water	16 fluidounces.

Dissolve the Citric Acid in the Water contained in a bottle, add the Bicarbonate of Sodium, dissolve it by agitation, and immediately stopper the bottle securely.

This preparation should be freshly prepared when wanted for use.

Note.—The German Pharm. directs that, when "Saturatio" is prescribed, without any specification of the ingredients or strength, *Potio Riveri*, represented here by *Liquor Sodii Citratis*, be dispensed.

238. LIQUOR SODII CITRO-TARTRATIS.

Solution of Citro-Tartrate of Sodium.

Bicarbonate of Sodium	390 grains.
Tartaric Acid	360 "
Citric Acid	30 "
Syrup	1½ fluidounces.
Water	10½ "

Dissolve *three hundred and sixty* (360) *grains* of the Bicarbonate of Sodium in the Water and add the Tartaric Acid. When this is dissolved, filter the solution, add the Syrup to the filtrate, then the remainder of the Bicarbonate of Sodium, and lastly, the Citric Acid, in crystals. Close the bottle at once with a stopper which should be securely tied.

239. LIQUOR SODII OLEATIS.

Solution of Oleate of Sodium.

White Castile Soap, dry and powdered	16 troy ounces.
Water	enough to make 16 pints.

Mix the Castile Soap with *four* (4) *pints* of Water so as to produce a uniform and gelatinous mixture. Then add *ten* (10) *pints* more of Water, apply heat until the Soap is dissolved, allow the liquid to cool and add enough Water to make it measure *sixteen* (16) *pints.*

Note.—This preparation is intended to be used in the preparation of Oleates.

240. LIQUOR STRYCHNINÆ ACETATIS.

Solution of Acetate of Strychnine.

Hall's Solution of Strychnine.

Acetate of Strychnine	16 grains.
Diluted Acetic Acid	½ fluidounce.
Alcohol	4 fluidounces.
Compound Tincture of Cardamom	60 minims.
Water	enough to make 16 fluidounces.

Dissolve the Acetate of Strychnine in about *eight* (8) *fluidounces* of Water mixed with the Diluted Acetic Acid, then add the Alcohol, Compound Tincture of Cardamom, and lastly, enough Water to make *sixteen* (16) *fluidounces.* Allow the mixture to stand a few days, if convenient, and filter.

Each fluidrachm contains ⅛ grain of Acetate of Strychnine.

Note.—The Brit. Pharm. directs a *Liquor Strychninæ Hydrochloratis* (with synonym: *Liquor Strychniæ*) which is much stronger, and should not be confounded with the above preparation. It should never be dispensed, unless expressly designated. It may be prepared by dissolving 1 grain of crystallized Strychnine (alkaloid) in 80 minims of Water with the aid of 2 drops of Diluted Hydrochloric Acid, and then adding 20 minims of Alcohol. The product contains ⅗ grain of Strychnine in each fluidrachm.

241. LIQUOR ZINCI ET FERRI COMPOSITUS.

Compound Solution of Zinc and Iron.

Deodorant Solution.

Sulphate of Zinc	16 troy ounces.
Sulphate of Iron	16 “ “
Naphthol	20 grains.
Oil of Thyme	60 minims.
Hypophosphorous Acid	120 “
Water	enough to make 5 pints.

Dissolve the Sulphate of Zinc and Sulphate of Iron in *five* (5) *pints* of boiling Water, add the Naphthol, and Oil of Thyme, and shake the mixture occasionally, in a stoppered bottle, until it is cold. Then add the Hypophosphorous Acid, filter the liquid through a wetted filter, and lastly, pass enough Water through the latter to make *five* (5) *pints*.

Note.—This solution is used as a simple deodorant and antiseptic for common domestic use, when it is unnecessary or impracticable to employ more powerful agents.

When a deodorant solution is required for purposes where *iron* is objectionable, as for instance, when woven fabrics are to be steeped in it, the following preparation may be employed :

2. *Liquor Zinci et Aluminii Compositus.*

Sulphate of Zinc	16 troy ounces.
Sulphate of Aluminium	16 “ “
Naphthol	20 grains.
Oil of Thyme	60 minims.
Water	enough to make 5 pints.

Dissolve the Sulphate of Zinc and the Sulphate of Aluminium in *five* (5) *pints* of Water, by the aid of heat, add the Naphthol and Oil of Thyme, and shake the mixture occasionally, in a stoppered bottle, until it cools. Set it aside for a few days, if convenient, and then pass it through a wetted filter, following it with enough Water to make *five* (5) *pints*.

The commercial Sulphate of Aluminium (*not* Alum) may be used for this preparation. This generally contains a trace of iron, but by allowing the liquid to stand, this will be gradually precipitated.

242. LIQUOR ZINCIBERIS.

Solution of Ginger.

Soluble Essence of Ginger.

Fluid Extract of Ginger	4 fluidounces.
Pumice, in moderately fine powder	1 troy ounce.
Water	enough to make 12 fluidounces.

Pour the Fluid Extract of Ginger into a bottle, add to it the Pumice, and shake the mixture thoroughly and repeatedly in the course of several hours. Then add the Water in portions of about *two* (2) *fluidounces*, shaking well and frequently after each addition.

When all is added, repeat the agitation occasionally during twenty-four hours, then filter, returning the first portions of the filtrate until it runs through clear, and, if necessary, pass enough Water through the filter to make *twelve* (12) *fluidounces.*

243. LOTIO ADSTRINGENS.

Astringent Lotion.

Warren's Styptic.

Sulphuric Acid	5 fluidrachms.
Oil of Turpentine	4 “
Alcohol	4 “

To the Sulphuric Acid, contained in a wedgewood mortar, slowly add the Oil of Turpentine, in small portions at a time, constantly stirring. Allow the mixture to cool, then add the Alcohol cautiously, in the same manner, and continue stirring until no more fumes arise. When the liquid is cold, pour it into a glass-stoppered bottle.

Note.—In preparing this mixture, caution should be used, so that the temperature may not rise too high. Particular care is to be observed, if a larger quantity of this mixture is to be prepared. In this case it is preferable to prepare it in several portions.

244. LOTIO FLAVA.

Yellow Lotion.

Yellow Wash. Aqua Phagedænica Flava (Germ. Pharm.).

Corrosive Chloride of Mercury	24 grains.
Water	a sufficient quantity.
Solution of Lime	enough to make 16 fluidounces.

Dissolve the Corrosive Chloride of Mercury in *one-half* (½) *fluidounce* of boiling Water, and add the solution to a sufficient quantity of Solution of Lime, to make *sixteen* (16) *fluidounces.*

This mixture should be well agitated whenever any of it is to be dispensed.

245. LOTIO NIGRA.

Black Lotion.

Black Wash. Aqua Phagedænica Nigra (Germ. Pharm.).

Mild Chloride of Mercury	64 grains.
Water	a sufficient quantity.
Solution of Lime	enough to make 16 fluidounces.

Triturate the Mild Chloride of Mercury with *one-half* (½) *fluidounce* of Water, and gradually add a sufficient quantity of Solution of Lime, to make *sixteen* (16) *fluidounces.*

This mixture should be well agitated, whenever any of it is to be dispensed.

246. LOTIO PLUMBI ET OPII.

Lotion of Lead and Opium.

Lead and Opium Wash.

Acetate of Lead	120 grains.
Tincture of Opium	½ fluidounce.
Water	enough to make 16 fluidounces.

Dissolve the Acetate of Lead in about *ten* (10) *fluidounces* of Water, add the Tincture of Opium, and enough Water to make *sixteen* (16) *fluidounces.*

This mixture should be well agitated, whenever any of it is to be dispensed.

247. MISTURA ACACIÆ.

Mixture of Acacia.

Mixtura Gummosa (Germ. Pharm. I.).

Acacia, in fine powder	1 troy ounce.
Sugar	1 " "
Water	12 fluidounces.

Dissolve the Acacia and Sugar in the Water.

This preparation should be freshly made, when wanted for use.

248. MISTURA ADSTRINGENS ET ESCHAROTICA.

Astringent and Escharotic Mixture.

Villate's Solution.

Solution of Subacetate of Lead	1½ fluidounces.
Sulphate of Copper	1 troy ounce.
Sulphate of Zinc	1 " "
Diluted Acetic Acid (U. S. P.)	13 fluidounces.

Dissolve the Sulphate of Copper and Sulphate of Zinc in the Diluted Acetic Acid, add the Solution of Subacetate of Lead, and agitate thoroughly. Set the mixture aside, so that the precipitate may subside. Then decant, or siphon off, the clear liquid and preserve it for use.

Note.—In attempting to pass the liquid through a filter, it will usually be found that the finely divided precipitate of sulphate of lead will partially pass along with it. This may be prevented (in this and many similar cases) by adding to the mixture a small quantity of starch, thoroughly incorporating this by agitation, and pouring the mixture on the previously wetted filter. The first portions of the filtrate are poured back until it runs through clear.

249. MISTURA AMMONII CHLORIDI.

Mixture of Chloride of Ammonium.

Mistura (or *Mixtura*) *Solvens Simplex.*

Chloride of Ammonium	180 grains.
Purified Extract of Glycyrrhiza	180 "
Water . . . enough to make	16 fluidounces

Dissolve the solids in a sufficient quantity of Water, to make *sixteen* (16) *fluidounces.*

Note.—Sometimes, a *Mistura* (or *Mixtura*) *Solvens Stibiata* is prescribed. This may be prepared by dissolving 2 grains of Tartrate of Antimony and Potassium in each pint of *Mistura Ammonii Chloridi.*

250. MISTURA CAMPHORÆ ACIDA.

Acid Camphor Mixture.

Mistura Antidysenterica. Hope's Mixture.

Nitric Acid	120 minims.
Tincture of Opium	80 "
Camphor Water . . . enough to make	16 fluidounces.

Mix the Nitric Acid with about *eight* (8) *fluidounces* of Camphor Water, add the Tincture of Opium, and lastly, enough Camphor Water, to make *sixteen* (16) *fluidounces.*

251. MISTURA CAMPHORÆ AROMATICA.

Aromatic Camphor Mixture.

Parrish's Camphor Mixture.

Compound Tincture of Lavender	4 fluidounces.
Sugar	½ troy ounce.
Camphor Water . . . enough to make	16 fluidounces.

Mix the Compound Tincture of Lavender with about *eight* (8) *fluidounces* of Camphor Water, dissolve the Sugar in the mixture, and add enough Water to make *sixteen* (16) *fluidounces.*

252. MISTURA CARMINATIVA.

Carminative Mixture.

Dalby's Carminative.

Carbonate of Magnesium	1 troy ounce.
Carbonate of Potassium	20 grains.
Tincture of Opium	180 minims.
Oil of Caraway	4 drops.
Oil of Fennel	4 "
Oil of Peppermint	4 "
Syrup	2½ fluidounces.
Water . . . enough to make	16 fluidounces.

Triturate the Oils with about *sixty* (60) *grains* of Carbonate of Magnesium, and *twelve* (12) *fluidounces* of Water, gradually added

Then add the remainder of the Carbonate of Magnesium and the other ingredients, and lastly, add enough Water to make *sixteen* (16) *fluidounces.*

This preparation should be freshly made, when wanted for use.

Each fluidounce represents about 1 grain of Opium.

253. MISTURA CHLORAL ET POTASSII BROMIDI COMPOSITA.

Compound Mixture of Chloral and Bromide of Potassium.

Chloral	4 troy ounces.
Bromide of Potassium	4 " "
Extract of Indian Cannabis	16 grains.
Extract of Hyoscyamus	16 "
Alcohol	1 fluidounce.
Tincture of Quillaja (N. F.)	1 "
Water	enough to make 16 fluidounces.

Dissolve the Chloral and Bromide of Potassium in *twelve* (12) *fluidounces* of Water, dissolve in this solution the Extract of Hyoscyamus, and add the Tincture of Quillaja. Then dissolve the Extract of Indian Cannabis in the Alcohol, and add this solution gradually, and under shaking, to that first prepared. Finally, add enough Water to make *sixteen* (16) *fluidounces.*

This preparation should be shaken whenever any of it is to be dispensed.

Each fluidrachm contains 15 grains, each, of Chloral, and of Bromide of Potassium, and ⅛ grain, each, of Extract of Indian Cannabis and of Extract of Hyoscyamus.

Note.—The resinous Extract of Indian Cannabis is merely held in suspension by means of the Tincture of Quillaja, as it is practically insoluble in the liquid. If the mixture is filtered, the resin will remain on the filter.

254. MISTURA CHLOROFORMI ET OPII.

Mixture of Chloroform and Opium.

Chloroform Anodyne.

Purified Chloroform	2 fluidounces.
Oil of Peppermint	16 minims.
Tincture of Indian Cannabis	2 fluidounces.
Tincture of Quillaja (N. F.)	2 "
Fluid Extract of Belladonna	128 minims.
Deodorized Tincture of Opium	2¾ fluidounces.
Tincture of Capsicum	1 fluidounce.
Purified Extract of Glycyrrhiza	240 grains.
Water	½ fluidounce.
Syrup	enough to make 16 fluidounces.

Triturate the Purified Extract of Glycyrrhiza with the Water and *one* (1) *fluidounce* of the Syrup until it is dissolved. Mix the Fluid

Extract of Belladonna, Deodorized Tincture of Opium and Tincture of Capsicum, and add them to the solution first prepared. Then mix the Chloroform, Oil of Peppermint, Tincture of Indian Cannabis and Tincture of Quillaja, and add them to the mixture. Finally add enough Syrup to make *sixteen* (16) *fluidounces* and mix the whole thoroughly together.

This mixture should be shaken, whenever any of it is to be dispensed.

Each fluidrachm represents 7½ minims of Chloroform, 7½ minims of Tincture of Indian Cannabis, 3¾ minims of Tincture of Capsicum, 1 minim of Fluid Extract of Belladonna, and about 1 grain of Opium.

Note.—This preparation is intended to fulfil the same purposes as the *Tinctura Chloroformi et Morphinæ* of the British Pharm., though the composition of the latter differs materially from that of the mixture above given.

255. MISTURA CONTRA DIARRHOEAM.

Diarrhœa Mixture.

Cholera Mixture.

1. Tincture of Opium, Tincture of Capsicum, Tincture of Rhubarb, Spirit of Camphor, Spirit of Peppermint, each	equal volumes.

Mix them, and filter.

Note.—The formula above given, which appears to be that in most general use, is also known under the name of "Sun Mixture."

Of other similar preparations, in more or less general use, the following may be mentioned here:

2. *Loomis' Diarrhœa Mixture.*

Tincture of Opium	½	fluidounce.
Tincture of Rhubarb	½	"
Compound Tincture of Catechu (U. S. P.)	1	"
Oil of Sassafras	20	minims.
Compound Tincture of Lavender . enough to make	4	fluidounces.

3. *Squibb's Diarrhœa Mixture.*

Tincture of Opium	1	fluidounce.
Tincture of Capsicum	1	"
Spirit of Camphor	1	"
Purified Chloroform	180	minims.
Alcohol . . . enough to make	5	fluidounces.

4. *Thielemann's Diarrhœa Mixture.*

Wine of Opium	1	fluidounce.
Tincture of Valerian	1½	fluidounces.
Ether	½	fluidounce.
Oil of Peppermint	60	minims.
Fluid Extract of Ipecac	15	"
Alcohol . enough to make	4	fluidounces.

This preparation is practically identical with the *Mixtura Thielemanni* of the Swedish Pharm.

5. Velpeau's Diarrhœa Mixture.

Tincture of Opium,	
Compound Tincture of Catechu, (U. S. P.)	
Spirit of Camphor, each	equal volumes.

256. MISTURA COPAIBÆ COMPOSITA.

Compound Copaiba Mixture.

1. Lafayette Mixture.

Copaiba	2	fluidounces.
Spirit of Nitrous Ether	2	"
Compound Tincture of Lavender	2	"
Solution of Potassa	½	fluidounce.
Syrup	5	fluidounces.
Mucilage of Dextrin (N. F.) . . . . enough to make	16	"

Mix the Copaiba with the Solution of Potassa and the Spirit of Nitrous Ether. Then add the Compound Tincture of Lavender, and lastly, the Syrup and Mucilage of Dextrin. Mix the whole thoroughly by shaking.

This mixture should be well agitated, whenever any of it is to be dispensed.

Each fluidrachm contains 7½ minims of Copaiba.

Note.—The above mixture has usually been prepared with Mucilage of Acacia; but if Mucilage of Dextrin (N. F.) be used, it will keep for a longer time without separating.

A mixture of somewhat similar composition, in considerable use in some parts of the country, is the following:

2. Chapman's Mixture.

Copaiba	4	fluidounces.
Spirit of Nitrous Ether	4	"
Compound Tincture of Lavender	½	fluidounce.
Tincture of Opium	½	"
Mucilage of Acacia	1½	fluidounces.
Water . . . . enough to make	16	"

257. MISTURA EXPECTORANS, STOKES.

Stokes' Expectorant Mixture.

Stokes' Expectorant.

Carbonate of Ammonium	128	grains.
Fluid Extract of Senega	½	fluidounce.
Fluid Extract of Squill	½	"
Camphorated Tincture of Opium	3	fluidounces.
Water	1½	"
Syrup of Tolu . . . . enough to make	16	"

Dissolve the Carbonate of Ammonium in the Water, add the

Fluid Extracts and Tincture, and lastly, enough Syrup of Tolu to make *sixteen* (16) *fluidounces.*

258. MISTURA GUAIACI.

Mixture of Guaiac.

Resin of Guaiac	190 grains.
Sugar	190 "
Acacia, in fine powder	100 "
Cinnamon Water	16 fluidounces.

Triturate the Resin of Guaiac with the Sugar and Acacia, then gradually add the Cinnamon Water, and mix thoroughly.

This mixture should be well agitated, whenever any of it is to be dispensed.

Note.—This preparation is practically identical with the *Mistura Guaiaci* of the Brit. Pharm.

259. MISTURA OLEO-BALSAMICA.

Oleo-balsamic Mixture.

Mixtura Oleoso-balsamica (Germ. Pharm.). *Balsamum Vitæ Hoffmanni.*

Oil of Lavender	30 minims.
Oil of Thyme	30 "
Oil of Lemon	30 "
Oil of Mace	30 "
Oil of Orange Flowers	30 "
Oil of Cloves	25 "
Oil of Cinnamon	25 "
Balsam of Peru	80 "
Alcohol	enough to make 16 fluidounces.

Dissolve the Oils and the Balsam of Peru in the Alcohol, let the solution stand a few days, and then filter.

260. MISTURA OLEI PICIS.

Mixture of Oil of Tar.

Mistura Picis Liquidæ. Tar Mixture.

Purified Extract of Glycyrrhiza	1 troy ounce.
Oil of Tar	½ fluidounce.
Sugar	4 troy ounces.
Chloroform	75 minims.
Oil of Peppermint	20 "
Alcohol	2½ fluidounces.
Water	enough to make 16 fluidounces.

Add the Purified Extract of Glycyrrhiza and the Sugar to *ten* (10) *fluidounces* of Water, contained in a covered vessel, and heat the mixture to boiling until the Extract and Sugar are dissolved. Then add the Oil of Tar, cover the vessel, and allow the contents to cool, stirring occasionally. Next add the Chloroform and Oil of Peppermint previously dissolved in the Alcohol, and lastly, enough Water to make *sixteen* (16) *fluidounces.*

This mixture should be well agitated, whenever any of it is to be dispensed.

261. MISTURA RHEI COMPOSITA.

Compound Mixture of Rhubarb.

Squibb's Rhubarb Mixture.

Fluid Extract of Rhubarb	86 minims.
Fluid Extract of Ipecac	16 "
Bicarbonate of Sodium	172 grains.
Glycerin	4 fluidounces.
Peppermint Water	enough to make 16 "

Dissolve the Bicarbonate of Sodium in about *eight* (8) *fluidounces* of Peppermint Water, then add the Fluid Extracts and Glycerin, and lastly, enough Peppermint Water to make *sixteen* (16) *fluidounces.*

262. MISTURA SASSAFRAS ET OPII.

Mixture of Sassafras and Opium.

Mistura Opii Alkalina. Godfrey's Cordial.

Oil of Sassafras	6 minims.
Tincture of Opium	256 "
Alcohol	360 "
Carbonate of Potassium	60 grains.
Molasses	5 fluidounces.
Water	enough to make 16 "

Mix the Tincture of Opium with the Alcohol in which the Oil of Sassafras had previously been dissolved. Dissolve the Carbonate of Potassium in about *eight* (8) *fluidounces* of Water, mix this with the Molasses, then add the mixture first prepared, and lastly, enough Water to make *sixteen* (16) *fluidounces.* Allow the mixture to become clear by standing, then pour off the liquid portion and preserve it for use.

Each fluidrachm contains 2 minims of Tincture of Opium, corresponding to about ⅕ grain of Opium.

263. MISTURA SODÆ ET MENTHÆ.

Mixture of Soda and Spearmint.

Soda Mint.

Bicarbonate of Sodium	320 grains.
Aromatic Spirit of Ammonia	60 minims.
Spearmint Water	enough to make 16 fluidounces.

Dissolve the Bicarbonate of Sodium in about *twelve* (12) *fluid* *ounces* of Spearmint Water, add the Aromatic Spirit of Ammonia, and enough Spearmint Water to make *sixteen* (16) *fluidounces.* Filter, if necessary.

264. MISTURA SPLENETICA.

Splenetic Mixture.

Spleen Mixture. Gadberry's Mixture.

Sulphate of Iron	100 grains.
Sulphate of Quinine	100 "
Nitric Acid	100 minims.
Nitrate of Potassium	300 grains.
Water	enough to make 16 fluidounces.

Triturate the Sulphate of Iron, reduced to powder, with the Nitric Acid previously mixed with an equal volume of Water. When effervescence has ceased, warm the mixture gently, until it no longer evolves visible vapors of a yellowish tint. Then add to it the Sulphate of Quinine, the Nitrate of Potassium, and lastly, enough Water to make *sixteen* (16) *fluidounces.* When solution has been effected, filter.

265. MISTURA SULPHURICA ACIDA.

Sulphuric Acid Mixture.

Mixtura Sulphurica Acida (Germ. Pharm.). *Haller's Acid Elixir.*

Sulphuric Acid	1 part.
Alcohol	enough to make 4 parts.

Add the Acid very gradually to *three* (3) *parts* of Alcohol, contained in a flask, agitating after each addition, and taking care, that the temperature of the mixture be not allowed to rise above 50° C. (122° F.) When the mixture is cold, add enough Alcohol, if necessary, to make *four* (4) *parts.*

Note.—The same product may be obtained, approximately, by carefully and slowly adding 1 volume of Sulphuric Acid to 7 volumes of Alcohol, and this method may be used when small quantities are required for immediate use in a prescription.

266. MUCILAGO CHONDRI.

Mucilage of Irish Moss.

Irish Moss	360 grains.
Water	enough to make 30 fluidounces.

Wash the Irish Moss with cold Water, then place it in a suitable vessel, add *thirty* (30) *fluidounces* of Water, and heat it, on a boiling water-bath, for fifteen minutes, frequently stirring. Then strain it through muslin, and pass enough Water through the strainer to make the liquid, when cold, measure *thirty* (30) *fluidounces.*

Mucilage of Irish Moss may also be prepared in the following manner:

Irish Moss Gelatin	240 grains.
Water	enough to make 30 fluidounces.

Heat the Irish Moss Gelatin with *thirty* (30) *fluidounces* of Water, at a boiling temperature, until it is completely dissolved. Then allow the solution to cool, and add enough Water, if necessary, to make up the volume to *thirty* (30) *fluidounces*.

Note.—Mucilage of Irish Moss, thus prepared, is well adapted for the preparation of emulsions of fixed oils. If it is, however, required for admixture with *clear* liquids, it should be diluted, when freshly made, and while still hot, with about 3 volumes of boiling water, filtered, and the filtrate evaporated to the volume corresponding to the proportions above given. The filtration may be greatly facilitated by filling the filter loosely with absorbent cotton, and pouring the liquid upon the latter.

Mucilage of Irish Moss may be preserved for some time by transferring it, while hot, into bottles, which should be filled to the neck, then pouring a layer of Olive Oil on top, securely stoppering the bottles, and keeping them, in an upright position, in a cool place. When the Mucilage is wanted for use, the layer of oil may be removed by means of absorbent cotton.

267. MUCILAGO DEXTRINI.

Mucilage of Dextrin.

Dextrin	1 part.
Water	enough to make 3 parts.

Mix them in a tared vessel, and heat the mixture, under constant stirring, to near boiling, until the Dextrin is dissolved and a limpid liquid results. Then restore any loss of water by evaporation, strain the liquid through muslin, and allow it to cool short of gelatinizing, when it will be ready for immediate use.

Note.—If the Mucilage is not at once to be used for preparing emulsions or other mixtures, transfer it, while hot, to bottles, which should be filled to the neck. Then pour into each bottle a sufficient quantity of Olive Oil to form a protecting layer, and when the mucilage has gelatinized, securely cork the bottles, and keep them in a cool place, in an upright position.

When gelatinized Mucilage of Dextrin is to be used for the preparation of emulsions or for other mixtures, pour off the protecting layer of oil from the surface, remove the remainder of the oil by a pellet of absorbent cotton, and warm the bottle gently, until the Mucilage is liquefied. Then allow it to cool short of gelatinizing.

The kind of Dextrin suitable for this preparation is the commercial, *white* variety, provided it still contains some unaltered or only partially altered starch, and forms a jelly on cooling, when made into a mucilage after the formula above given. The yellow variety, which is completely soluble in about 2 parts of cold water, will not answer the purpose.

268. MUCILAGO SALEP.

Mucilage of Salep.

Salep, in fine powder	70	grains.
Cold Water	1½	fluidounces.
Boiling Water	14½	"

Place the powdered Salep into a flask containing the Cold Water, and shake until the powder is divided. Then add the Boiling Water, and shake the mixture continuously until it has cooled to 25° C. (77° F.), or below this temperature. The cooling may be hastened by frequent and brief immersion of the flask in cold water.

Mucilage of Salep should be freshly made, when wanted for use.

Note.—If Sugar or Syrup is prescribed in the same mixture with Mucilage of Salep, it is preferable to triturate the required quantity of powdered Salep with either of the former, as the case may be, and then to add rapidly the proportionate amount of Boiling Water.

269. OLEA INFUSA.

Infused Oils.

The Dry Herb, in moderately coarse (No. 40) powder	100	parts.
Alcohol	75	"
Water of Ammonia	2	"
Lard Oil	250	"
Cotton Seed Oil	250	"

Moisten the powdered Herb with a sufficient quantity of the Alcohol and Water of Ammonia previously mixed, then pack it tightly into a stone or enamelled iron-vessel of suitable capacity, pour on the remainder of the ammoniated Alcohol, cover it well, and allow the mixture to macerate for twenty-four hours. Then add *sixty* (60) *parts* of the mixed Oils, digest, under frequent agitation, during twelve hours, at a temperature between 50° and 60° C. (122° to 140° F.), transfer the mixture to a strainer, and express strongly. To the residue, returned to the vessel, add the remainder of the Oils, digest and express in the same manner, and unite the expressed portions.

Note.—This process is a modification of that prescribed by the *Germ. Pharm.* The alcohol and free ammonia are dissipated during the digestion. Infused Oils are usually prepared only from so-called narcotic plants, but it is known that only a portion of their active constituents is taken up by the oil. The above process is to be used for the preparation of *Oleum Hyoscyami* of the Germ. Pharm., and similar infused oils.

270. OLEATUM ACONITINÆ.

Oleate of Aconitine.

Aconitine, alkaloid	2	parts.
Oleic Acid	98	"

Triturate the Aconitine with a small portion of the Oleic Acid in a mortar, then incorporate the remainder of the Oleic Acid, and stir the mixture frequently until the alkaloid is dissolved.

Note.—The market affords a variety of Aconitines made by different processes, by different manufacturers, and of greatly different potency. Only the pure crystallized or crystallizable alkaloid, prepared by Duquesnel's method, or at least one equal to it in strength, should be used for this preparation.

271. OLEATUM PLUMBI.

Oleate of Lead.

Acetate of Lead	3 troy ounces.
Solution of Oleate of Sodium (N. F.)	5 pints.
Acetic Acid,	
Water	each, a sufficient quantity.

Dissolve the Acetate of Lead in *ten* (10) *pints* of Water. Should the solution be turbid or opalescent, add to it Acetic Acid, in drops, until it has become clear. Then filter it, if necessary, through a pellet of absorbent cotton placed in the neck of a funnel, and mix it slowly, and under constant stirring, with the Solution of Oleate of Sodium. Heat the mixture to boiling, transfer it to a strainer, and when the liquid has drained off, wash the residue with *ten* (10) *pints* of boiling Water. Lastly, take the mass from the strainer, remove any occluded Water by pressure, and transfer it, while warm and soft, to suitable vessels.

The product contains an amount of Lead corresponding to about 28 per cent. of Oxide of Lead.

Note.—The theoretical yield of Oleate of Lead obtainable from 3 troy ounces of acetate of lead is 2839 grains; in practice, about 5 troy ounces will be obtained. Oleate of Lead prepared by the above process is of about the consistence of lead-plaster, and may be converted into an ointment by mixing with it such a proportion of oleic acid as may be required.

272. OLEATUM QUININÆ.

Oleate of Quinine.

Quinine (U. S. P., 1880), dried at 100° C. (212° F.) until it ceases to lose weight	25 parts.
Oleic Acid	75 "

Triturate the Quinine with the Oleic Acid, gradually added, then apply a gentle heat, and stir frequently, until the Quinine is dissolved.

The product contains 25 per cent. of dry Quinine.

Note.—When the officinal Quinine ($C_{20}H_{24}N_2O_2 \cdot 3H_2O$) is not available, the quantity corresponding to 25 parts of dry Quinine may be prepared as follows: Take 34 parts of officinal Sulphate of Quinine, dissolve it in 200 parts of Water with the aid of a sufficient quantity of Diluted Sulphuric Acid, then precipitate the Quinine by means of Water of Ammonia, added, under constant stirring, until it is in slight excess. Transfer the magma to a close muslin strainer, previously wetted, allow the liquid to drain off, and wash the precipitate with ice-cold Water, until the washings are practically tasteless, but using not more than about 200 parts of Water. Lastly, dry the precipitate.

The theoretical quantity of dry quinine obtainable from 34 parts of the sulphate is 25.27 parts. In practice, approximately 25 parts will be obtained.

273. OLEATUM ZINCI.

Oleate of Zinc.

Acetate of Zinc, crystallized	3 troy ounces.
Solution of Oleate of Sodium (N. F.)	8 pints.
Water	a sufficient quantity.

Dissolve the Acetate of Zinc in *sixteen* (16) *pints* of cold Water, filter the solution, if necessary, through a pellet of absorbent cotton placed in the neck of a funnel, and then mix it slowly and under constant stirring, with the Solution of Oleate of Sodium. Transfer the mixture to a wetted muslin strainer, and when the liquid has drained off, wash the precipitate with Water, until the washings are practically tasteless. Lastly, dry the precipitate, spread on paper, by exposure to dust-free air, without heat.

The product contains an amount of Zinc corresponding to about 13 per cent. of Oxide of Zinc.

Note.—The theoretical yield of Oleate of Zinc obtainable from 3 troy ounces of acetate of zinc is 3600 grains; in practice, about 7 troy ounces will be obtained. Oleate of Zinc, prepared by the above process, is in the form of a soft, white powder, and may be converted into a plaster or ointment by mixing it with such a proportion of oleic acid as may be required.

274. OLEOSACCHARA.

Oil-Sugars.

Elæosacchara (Germ. Pharm.).

Any Volatile Oil	1 drop.
Sugar	30 grains.

Triturate the Sugar with the Volatile Oil to a fine powder.

This preparation should be freshly made, when wanted for use.

Note.—When *Elæosaccharum Anisi*, *E. Fœniculi*, *E. Menthæ Piperitæ*, etc., etc., are prescribed, these are to be prepared from the corresponding essential oils, according to the above formula.

275. OLEUM CARBOLATUM.

Carbolized Oil.

Carbolic Acid	5 parts.
Cotton Seed Oil	95 “

Melt the Carbolic Acid with a gentle heat, and mix it with the Cotton Seed Oil.

276. OLEUM HYOSCYAMI COMPOSITUM.

Compound Oil of Hyoscyamus.

Balsamum Tranquillans.

Oil of Absinth	3 drops.
Oil of Lavender	3 "
Oil of Rosemary	3 "
Oil of Sage	3 "
Oil of Thyme	3 "
Infused Oil of Hyoscyamus	5 fluidounces.

Mix them.

Note.—Oil of Absinth is the volatile oil of *Artemisia Absinthium* Linné. (Wormwood), and Oil of Sage is the volatile oil of *Salvia officinalis* Linné. Infused Oil of Hyoscyamus is the *Oleum Hyoscyami* of the Germ. Pharm.; see under No. 269. The *Baume Tranquille* (*Balsamum tranquillans*) of the Codex is a more complex preparation, not identical with the above, but possessing about the same properties.

277. OXYMEL SCILLÆ.

Oxymel of Squill.

Vinegar of Squill	5 parts.
Honey	10 "

Mix them in a tared porcelain capsule or enamelled iron vessel, and apply the heat of a water-bath until the mixture has been reduced to the weight of *ten* (10) *parts*. Then strain, allow it to cool, and transfer it to bottles, which should be well corked.

278. PANCREATINUM.

Pancreatin.

Pancreas of the Hog, fresh,	
Water,	
Alcohol	each, a sufficient quantity.

Reduce the fresh Pancreas of the Hog, freed as much as possible from fat and membranes, to a fine paste by means of a suitable chopping machine. Mix it with half its weight of cold Water, and knead it thoroughly and frequently during one hour; then transfer the mass to a strainer, express it forcibly, filter the liquid as quickly as possible through flannel, and add to the filtrate an equal volume of Alcohol. Collect the precipitate, drain it, and free it by pressure from as much of the adherent liquid as possible. Then spread it on shallow trays, dry it by exposure to warm air, at a temperature not exceeding 40° C. (104° F.), reduce it to powder, and keep it in well-stoppered bottles.

Note.—If larger quantities of Pancreas are operated upon, and there is risk of its decomposition in presence of the water, it is advisable to saturate the latter with chloroform, which will retard decomposition for a long time.

If there be added to 4 fluidounces of tepid water, contained in a suitable flask or bottle, first, 5 grains of Pancreatin and 20 grains of bicarbonate of sodium, and afterwards 1 pint of fresh cow's milk, previously heated to 38° C. (100.4° F.), and if this mixture be maintained at the same temperature for thirty minutes, the milk should be so completely peptonized that, on adding to a small portion of it, transferred to a test-tube, a slight excess of nitric acid, coagulation should not occur.

As peptonized milk is chiefly used as a food for the sick, and as Pancreatin is probably most largely employed for the practical purpose of peptonizing milk, it is important to observe the quality of the peptonized product yielded with any specimen of Pancreatin. Peptonized milk as prepared by the above process, or when the process is allowed to go on to the development of a very distinct bitter flavor, should not have an odor at all suggestive of rancidity. Milk has simply a marked bitter taste when thoroughly peptonized.

In place of Pancreatin, prepared by the formula above given, any other commercial preparation of the Pancreas may be used, provided it reaches the standard of peptonizing power prescribed for the former. (See also *Note* to No. 318.)

279. PEPSINUM.

Pepsin.

The digestive principle of the gastric juice, obtained from the mucous membrane of the stomach of the hog, prepared in a dry and undiluted form, and capable of dissolving not less than *five hundred* (500) *times* its own weight of hard-boiled egg-albumen, under the conditions prescribed for the process of assay below given.

Assay of Pepsin.

1. *Preliminary Assay.*—Prepare an Acidulated Water by mixing 1 liter of Distilled Water with 5 Gm. of Hydrochloric Acid. Mix 0.1 Gm. of the dry and undiluted Pepsin with 0.9 Gm. of Sugar of Milk, by thorough trituration in a wedgewood mortar. Weigh of this mixture four portions, of 0.05 Gm. (*A*),—0.06 Gm. (*B*),—0.1 Gm. (*C*),—and 0.2 Gm. (*D*), respectively, place each portion into a wide-mouthed flask, or bottle of the capacity of about 200 C.c., together with 80 C.c. of the Acidulated Water, previously warmed, and set the flasks in a water-bath, the temperature of which is maintained constantly at 51.6° C. (125° F.). After twenty minutes, add to the contents of each flask 10 Gm. of hard-boiled egg-albumen, prepared by boiling fresh eggs for fifteen minutes, then separating the whites and rubbing this through a clean hair sieve having 30 meshes to the linear inch. Each portion of 10 Gm. of egg albumen is to be put into a small warmed mortar, triturated with a portion of the fluid from one of the flasks, the mixture then transferred to the latter, and the mortar rinsed with 20 C.c. of warmed Acidulated Water, which is added to the contents of the flask. Keep the flasks in the water-bath for sixty minutes, shaking well at intervals of five minutes, and at the end of that time note the condition of the egg albumen in the several flasks. If the Pepsin is of good quality, not more than a few undissolved flakes may remain in any but the first flask (*A*). If more than this remains in the fourth flask (*D*), the Pepsin should be rejected, as being below the requisite standard.

2. *Actual Assay.*—Having thus ascertained the approximate digestive power of the Pepsin, and having found this to be of satisfactory strength, make at least two assays, in precisely the same manner as just described, but using such a pro-

portion of egg albumen that about one-fourth of it will remain undissolved at the close of the experiment.

Then add to the contents of the flask 3 Gm. of finely scraped and purified asbestos, previously dried to a constant weight, and afterwards add 100 C.c. of cold distilled water. Shake the flask strongly, until the asbestos has clarified the liquid as far as possible, then transfer the contents of the flask to a tared filter (deprived of matters soluble in hydrochloric acid), wash the residue with distilled water, until the washings cease to affect test-solution of nitrate of silver acidulated with nitric acid, and dry the filter with contents at a temperature of 105° C. (221° F.), to a constant weight. From this deduct the weight of the filter and asbestos. Multiply the remainder (representing the undigested and dried albumen) by 7.5, to find the quantity of moist egg albumen to which it corresponds, and deduct the product from the amount originally used, to ascertain the proportion dissolved by the Pepsin.

Note.—Finely scraped asbestos has been found to be the best medium for clarifying liquids containing peptones. Pure, white, fibrous asbestos should be scraped with a knife so as to obtain a fine feathery mass, which is boiled with diluted hydrochloric acid, then thoroughly washed with water, and dried. If it is to be used in quantitative determinations requiring its subsequent ignition, it should be ignited before its tare is taken.

280. PEPSINUM AROMATICUM.

Aromatic Pepsin.

Saccharated Pepsin	1	troy ounce.
Aromatic Fluid Extract (U. S. P.)	30	minims.
Tartaric Acid	8	grains.
Chloride of Sodium	8	"

Mix the ingredients by trituration, dry the product by exposure to warm air, and keep it in well-stoppered bottles.

281. PEPSINUM SACCHARATUM.

Saccharated Pepsin.

Pepsin (N. F.)	a sufficient quantity.
Sugar of Milk	enough to make 100 parts.

Triturate as many parts of the Pepsin as may be found to be capable of dissolving *five thousand* (5,000) *parts* of egg albumen by the process of assay given under *Pepsinum*, with enough Sugar of Milk to make *one hundred* (100) *parts*.

Note.—The process of assay given under *Pepsinum* (see No. 279) is also applicable to this preparation.

Pepsinum Saccharatum is officinal in the U. S. P., but no process is there given for its preparation. The product obtained by the above formula corresponds, in strength, to that intended by the U. S. P.

282. PILULÆ.

Pills.

Note.—In stating the quantities of the several ingredients for each single pill, in the formulæ hereafter given, it was often necessary to choose the nearest simple fraction, approximating the true value. When a larger number of pills is to be prepared in accordance with the given proportions, and the quantities of the ingredients are to be determined by multiplying with the number of pills required, it is recommended that the nearest whole number, or nearest convenient fraction, in each case, be chosen.

283. PILULÆ AD PRANDIUM.

Dinner Pills.

1. When "Dinner Pills," under this or some other equivalent name, are prescribed without further specification, it is recommended that the *Pilulæ Aloes et Masticheſ* of the U. S. P., also called Lady Webster's Dinner Pills, be dispensed.

Note.—Of other combinations, bearing similar names, or used for similar purposes, the following appear to be those most commonly in use:

2. *Chapman's Dinner Pill.*

	Each pill contains:
Aloes	1½ grains.
Mastic	1½ "
Ipecac, in fine powder	1 grain.
Oil of Fennel, about	¼ minim.

3. *Cole's Dinner Pill.*

	Each pill contains:
Aloes	1⅕ grains.
Mass of Mercury	1⅕ "
Jalap, in fine powder	1⅕ "
Tartrate of Antimony and Potassium	1/50 "

4. *Hall's Dinner Pill.*

	Each pill contains:
Aloes	1 grain.
Extract of Glycyrrhiza	1 "
Soap, in powder	1 "
Molasses	1 "

284. PILULÆ ALOES ET PODOPHYLLI COMPOSITÆ.

Compound Pills of Aloes and Podophyllum.

Janeway's Pills.

	Each pill contains:
Aloes	1 grain.
Resin of Podophyllum	½ "
Alcoholic Extract of Belladonna	¼ "
Extract of Nux Vomica	¼ "

285. PILULÆ ALOINI COMPOSITÆ.

Compound Pills of Aloin.

	Each pill contains:
Aloin	½ grain.
Resin of Podophyllum	⅛ "
Extract of Belladonna	¼ "

286. PILULÆ ALOINI, STRYCHNINÆ ET BELLADONNÆ.

Pills of Aloin, Strychnine and Belladonna.

	Each pill contains:
Aloin	$\frac{1}{5}$ grain.
Strychnine, alkaloid	$\frac{1}{120}$ "
Alcoholic Extract of Belladonna	$\frac{1}{8}$ "

Note.—These pills are also prepared with double the amount of Strychnine. It is recommended that the stronger pills be dispensed only when specially demanded.

287. PILULÆ ALOINI, STRYCHNINÆ ET BELLADONNÆ COMPOSITÆ.

Compound Pills of Aloin, Strychnine and Belladonna.

	Each pill contains:
Aloin	$\frac{1}{5}$ grain.
Strychnine, alkaloid	$\frac{1}{120}$ "
Alcoholic Extract of Belladonna	$\frac{1}{8}$ "
Extract of Rhamnus Purshiana	$\frac{1}{2}$ "

Note.—If Extract of Rhamnus Purshiana is not available, take Fluid Extract of Rhamnus Purshiana, prepared without Glycerin (see No. 165), and evaporate it, on a water-bath, to a pilular consistence.

These pills are also prepared with double the amount of Strychnine. It is recommended that the stronger pills be dispensed only when specially demanded.

288. PILULÆ ANTIDYSPEPTICÆ.

Antidyspeptic Pills.

	Each pill contains:
Strychnine, alkaloid	$\frac{1}{40}$ grain.
Ipecac, in fine powder	$\frac{1}{10}$ "
Alcoholic Extract of Belladonna	$\frac{1}{10}$ "
Mass of Mercury	2 grains.
Compound Extract of Colocynth	2 "

289. PILULÆ ANTINEURALGICÆ.

Antineuralgic Pills.

1. *Gross' Antineuralgic Pills.*	*Each pill contains:*
Sulphate of Quinine	2 grains.
Sulphate of Morphine	$\frac{1}{20}$ grain.
Strychnine, alkaloid	$\frac{1}{30}$ "
Arsenious Acid	$\frac{1}{20}$ "
Extract of Aconite Leaves (U. S. P. 1870)	$\frac{1}{2}$ "

Note.—When "Antineuralgic Pills," or "Neuralgia Pills," without other specification, are prescribed, it is recommended that the above preparation be dispensed. Sometimes the Sulphate of Morphine is directed to be omitted.

2. *Brown-Séquard's Antineuralgic* (or *Neuralgia*) *Pills* have the following composition:

	Each pill contains:	
Extract of Hyoscyamus	2/3	grain.
Extract of Conium	2/3	"
Extract of Ignatia	1/2	"
Extract of Opium	1/2	"
Extract of Aconite Leaves (U. S. P. 1870)	1/3	"
Extract of Indian Cannabis	1/4	"
Extract of Stramonium	1/5	"
Alcoholic Extract of Belladonna	1/6	"

290. PILULÆ ANTIPERIODICÆ.

Antiperiodic Pills.

Warburg's Pills.

1. *With Aloes:*

	Each pill contains:	
Aqueous Extract of Aloes	1	grain.
Rhubarb	1/2	"
Angelica, seed	1/2	"
Elecampane	1/4	"
Saffron	1/4	"
Fennel	1/4	"
Zedoary, root	1/8	"
Cubebs	1/8	"
Myrrh	1/8	"
White Agaric	1/8	"
Camphor	1/8	"
Sulphate of Quinine	1 2/5	grains.
Extract of Gentian	a sufficient quantity.	

Reduce the drugs to a fine, uniform powder, and make this into pills, by means of Extract of Gentian, in accordance with the formula above given.

2. *Without Aloes:*

Prepare the pills in the same manner as directed in the previous formula, but omit the Aqueous Extract of Aloes.

Note.—These pills have been introduced for the purpose of facilitating the administration of Warburg's Tincture in a solid form. When "Warburg's Pills," or "Pills of Warburg's Tincture" are prescribed, without further specification, those containing Aloes should be dispensed. Those without Aloes should be furnished only when they are expressly demanded.

Each Warburg's Pill represents about 1 fluidrachm of Warburg's Tincture, with or without aloes, respectively (see *Tinctura Antiperiodica*).

291. PILULÆ CATHARTICÆ VEGETABILES.

Vegetable Cathartic Pills.

"Improved" Vegetable Cathartic Pills.

	Each pill contains:
Compound Extract of Colocynth	1 grain.
Resin of Podophyllum	¼ "
Extract of Leptandra	¼ "
Abstract of Jalap, in fine powder	½ "
Extract of Hyoscyamus	½ "
Extract of Gentian	½ "
Oil of Peppermint	⅛ minim.

Note.—Extract of Leptandra (U. S. P.) is preferable to the so-called Leptandrin, or Resin of Leptandra, as this is of very uncertain and varying composition.

292. PILULÆ COLOCYNTHIDIS COMPOSITÆ.

Compound Pills of Colocynth.

Pilulæ Cocciæ. Cochia Pills.

	Each pill contains:
Extract of Colocynth	⅙ grain.
Aloes	2 grains.
Resin of Scammony	2 "
Oil of Cloves	¼ minim.

Note.—The *Pilula Colocynthidis Composita* of the Brit. Pharm., for which the above is an equivalent, is prepared with Colocynth Pulp, and contains Sulphate of Potassium, which was originally added as an aid to reduce the ingredients to powder. With the use of Extract of Colocynth, this becomes unnecessary.

The Brit. Pharm. directs the above to be kept as a pill-mass, to be made into pills of such weight as may be prescribed. When such specification is omitted, it is recommended to dispense pills containing the quantities above directed.

293. PILULÆ COLOCYNTHIDIS ET HYOSCYAMI.

Pills of Colocynth and Hyoscyamus.

	Each pill contains:
Extract of Colocynth	1/10 grain.
Aloes	1½ grains.
Resin of Scammony	1½ "
Oil of Cloves	⅙ minim.
Extract of Hyoscyamus	1½ grains.

Note.—The *Pilula Colocynthidis et Hyoscyami* of the Brit. Pharm. is directed to be made by mixing 2 parts of Compound Pill of Colocynth (see No. 292) with 1 part of Extract of Hyoscyamus, and is directed to be kept as a pill-mass, to be made into pills of such weight as may be directed. When such specification is omitted, it is recommended to dispense pills containing the quantities above directed.

294. PILULÆ COLOCYNTHIDIS ET PODOPHYLLI.

Pills of Colocynth and Podophyllum.

	Each pill contains:
Compound Extract of Colocynth	2½ grains.
Resin of Podophyllum	¼ grain.

295. PILULÆ FERRI CARBONATIS.

Pills of Carbonate of Iron.

Ferruginous Pills. Blaud's Pills. Chalybeate Pills.

Sulphate of Iron, in clear crystals	240 grains.
Carbonate of Potassium	140 "
Sugar	48 "
Tragacanth, in fine powder	16 "
Glycerin	10 minims.
Water	a sufficient quantity.

Triturate the Sulphate of Iron with the Sugar to a uniform powder. In another mortar triturate the Carbonate of Potassium with the Glycerin and *ten* (10) *minims* of Water. Add to this mixture the previously prepared powder, and beat the mass thoroughly until it assumes a greenish color. When the reaction appears to have terminated, incorporate the Tragacanth, and, if necessary, add a little more Water, so as to obtain a mass of a pilular consistence. Divide this into *ninety-six* (96) *pills.*

Each pill represents about 1 grain of Carbonate of Iron (ferrous).

Note.—Sometimes so-called "3 grain" Blaud's Pills (*Pilulæ Blaudii minores*) are prescribed or demanded. These may be prepared by using the quantities given in the above formula, and dividing the mass into *one hundred and sixty-eight* (168) *pills.*

296. PILULÆ GLONOINI.

Pills of Glonoin.

Pills of Nitroglycerin.

Spirit of Glonoin (N. F., 1%)	200 grains.
Althæa, in fine powder	198 "
Confection of Rose	a sufficient quantity.

Mix the Spirit of Glonoin intimately with the powdered Althæa, expose the mixture for a short time to the air, so that the alcohol may evaporate, then make a pill-mass by means of Confection of Rose, and divide it into *two hundred* (200) *pills.*

Each pill contains $\frac{1}{100}$ grain of Glonoin (Nitroglycerin).

297. PILULÆ LAXATIVÆ POST PARTUM.

Laxative Pills after Confinement.

Barker's Post Partum Pills.

	Each pill contains:
Compound Extract of Colocynth	$1\frac{2}{3}$ grains.
Aloes	$\frac{5}{6}$ grain.
Extract of Nux Vomica	$\frac{5}{12}$ "
Resin of Podophyllum	$\frac{1}{12}$ "
Ipecac, in fine powder	$\frac{1}{12}$ "
Extract of Hyoscyamus	$1\frac{1}{4}$ "

Note.—This is the formula generally employed by Dr. Fordyce Barker, except where special circumstances render modifications necessary. The formula usually quoted in manufacturers' lists and some formularies is not correct.

298. PILULÆ METALLORUM.

Metallic Pills.

Pilulæ Metallorum Amaræ. Bitter Metallic Pills.

	Each pill contains:
Reduced Iron	1 grain.
Sulphate of Quinine	1 "
Strychnine, alkaloid	$\frac{1}{20}$ "
Arsenious Acid	$\frac{1}{20}$ "

Note.—A similar combination is known under the name of *Aitken's Tonic Pills:*

	Each pill contains:
Reduced Iron	$\frac{2}{3}$ grain.
Sulphate of Quinine	1 "
Strychnine, alkaloid	$\frac{1}{50}$ "
Arsenious Acid	$\frac{1}{50}$ "

299. PILULÆ OPII ET CAMPHORÆ.

Pills of Opium and Camphor.

	Each pill contains:
Powdered Opium	1 grain.
Camphor	2 grains.

300. PILULÆ OPII ET PLUMBI.

Pills of Opium and Lead.

	Each pill contains:
Powdered Opium	1 grain.
Acetate of Lead	1 "

301. PILULÆ PODOPHYLLI, BELLADONNÆ ET CAPSICI.

Pills of Podophyllum, Belladonna and Capsicum.

Squibb's Podophyllum Pills.

	Each pill contains:
Resin of Podophyllum	¼ grain.
Alcoholic Extract of Belladonna	⅛ "
Capsicum, in moderately fine powder	½ "
Sugar of Milk, in fine powder	1 "
Acacia, in fine powder	¼ "
Glycerin,	
Syrup	each, a sufficient quantity.

302. PILULÆ QUADRUPLICES.

Quadruplex Pills.

Quatuor Pills. Pilulæ Ferri et Quininæ Compositæ.

	Each pill contains:
Dried Sulphate of Iron	1 grain.
Sulphate of Quinine	1 "
Aloes	1 "
Extract of Nux Vomica	¼ "
Extract of Gentian	a sufficient quantity.

303. PILULÆ TRIPLICES.

Triplex Pills.

Pilula Triplex.

	Each pill contains:
1. Aloes	2 grains.
Mass of Mercury	1 grain.
Resin of Podophyllum	¼ "

Note.—When *Pilula Triplex*, under this name or some equivalent, is prescribed without further specification, it is recommended that the above preparation be dispensed. A formula devised by Dr. John W. Francis is also in use:

2. *Francis' Triplex Pill.*

Aloes	⅚ grain.
Scammony	⅚ "
Mass of Mercury	⅚ "
Croton Oil	$\frac{1}{20}$ minim.
Oil of Caraway	¼ "
Tincture of Aloes and Myrrh	a sufficient quantity

304. POTASSII BROMIDUM EFFERVESCENS.

Effervescent Bromide of Potassium.

Bromide of Potassium	400 parts.
Bicarbonate of Sodium	600 "
Tartaric Acid	540 "
Sugar, in very fine powder	260 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enameled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of the above compound represent 20 grains of Bromide of Potassium.

305. POTASSII BROMIDUM EFFERVESCENS CUM CAFFEINA.

Effervescent Bromide of Potassium with Caffeine.

Bromide of Potassium	200	parts.
Caffeine	20	"
Bicarbonate of Sodium	600	"
Tartaric Acid	540	"
Sugar, in very fine powder	440	"

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of the above compound represent 10 grains of Bromide of Potassium and 1 grain of Caffeine.

306. POTASSII CITRAS EFFERVESCENS.

Effervescent Citrate of Potassium.

Citrate of Potassium	200	parts.
Bicarbonate of Sodium	600	"
Tartaric Acid	540	"
Sugar, in very fine powder	460	"

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of the above compound represent 10 grains of Citrate of Potassium.

307. PULVIS ACACIÆ COMPOSITUS.

Compound Powder of Acacia.

Pulvis Gummosus (Germ. Pharm.)

Acacia, in fine powder	15 parts.
Glycyrrhiza, in fine powder	10 "
Sugar, in fine powder	5 "

Mix them intimately.

308. PULVIS ALOES ET CANELLÆ.

Powder of Aloes and Canella.

Hiera Picra.

Aloes, in fine powder	4 parts.
Canella, in fine powder	1 part.

Mix them intimately.

309. PULVIS AMYGDALÆ COMPOSITUS.

Compound Powder of Almond.

Sweet Almond	6 parts.
Sugar, in fine powder	3 "
Acacia, in fine powder	1 part.

Blanch the Sweet Almond, then dry them thoroughly with a soft cloth, and rub them lightly in a mortar, until they form a mass of a smooth consistence. Mix the Acacia and Sugar, add them to the mass previously prepared, and rub the whole to a coarse powder, which is to be preserved in a lightly covered jar.

Note.—If 820 grains of this preparation be thoroughly triturated with 17 fluidounces of Water, gradually added, and the mixture finally strained, the product will be about 16 fluidounces of *Mistura Amygdalæ* (U. S. P.).

310. PULVIS ANTICATARRHALIS.

Catarrh Powder.

Catarrh Snuff.

Hydrochlorate of Morphine	1 part.
Acacia, in fine powder	60 parts.
Subnitrate of Bismuth	180 "

Mix them intimately by trituration.

311. PULVIS CATECHU COMPOSITUS.

Compound Powder of Catechu.

Catechu, in fine powder	4 parts.
Kino, in fine powder	2 "
Krameria, in fine powder	2 "
Cinnamon, in fine powder	1 part.
Nutmeg, in fine powder	1 "

Mix them intimately, pass the powder through a fine sieve, and afterwards rub it lightly in a mortar. Keep it in a stoppered bottle.

Note.—This preparation is officinal in the Brit. Pharm.

312. PULVIS CRETÆ AROMATICUS.

Aromatic Powder of Chalk.

Cinnamon	4	parts.
Saffron	3	"
Nutmeg	3	"
Cloves	1½	"
Cardamom	1	part.
Prepared Chalk	11	parts.
Sugar	25	"

Mix the ingredients and reduce them to a fine powder. Pass this through a fine sieve, and afterwards rub it lightly in a mortar. Keep it in a stoppered bottle.

Note.—This preparation is equivalent to the *Pulvis Cretæ Aromaticus* of the Brit. Pharm. This authority adds the following note: "If a product of bright color be desired, the saffron may previously be moistened and triturated with a little water or alcohol, or the fresh and faintly damp mixture may be subjected to considerable pressure in the triturating process."

313. PULVIS CRETÆ AROMATICUS CUM OPIO.

Aromatic Powder of Chalk with Opium.

Aromatic Powder of Chalk	39	parts.
Powdered Opium	1	part.

Mix them intimately.

Every 40 grains of this preparation contain 1 grain of Powdered Opium.

Note.--This preparation is officinal in the Brit. Pharm.

314. PULVIS HYDRARGYRI CHLORIDI MITIS ET JALAPÆ.

Powder of Mild Chloride of Mercury and Jalap.

Calomel and Jalap.

Mild Chloride of Mercury	10	grains.
Jalap, in fine powder	20	"

Mix them intimately.

Note.—When "Calomel and Jalap" is prescribed for an adult, without any specification of quantities, it is recommended that the above mixture be dispensed as one dose.

315. PULVIS IODOFORMI DILUTUS.

Diluted Powder of Iodoform.

Iodoform and Naphthalin.

Iodoform, in fine powder	2 troy ounces.
Boric Acid, in fine powder	3 “ “
Naphthalin	5 “ “
Oil of Bergamot	120 minims.

Triturate the Naphthalin with the Oil of Bergamot, then mix it with the Iodoform and Boric Acid, and triturate until a homogeneous powder is produced.

Note.—This powder is used in many cases, where a *diluted* preparation of Iodoform, for external purposes, is desired. The odor of the Iodoform is masked both by the Oil of Bergamot, and by the Naphthalin.

316. PULVIS KINO COMPOSITUS.

Compound Powder of Kino.

Kino, in fine powder	15 parts.
Powdered Opium	1 part.
Cinnamon, in fine powder	4 parts.

Mix them intimately, pass the mixed powder through a moderately fine sieve, and afterwards rub it lightly in a mortar. Keep it in a stoppered bottle.

Every 20 grains of this preparation contain 1 grain of Powdered Opium.

Note.—This preparation is officinal in the Brit. Pharm.

317. PULVIS MYRICÆ COMPOSITUS.

Compound Powder of Bayberry.

Composition Powder.

Bayberry, bark of the root	12 parts.
Ginger	6 “
Capsicum	1 part.
Cloves	1 “

Reduce the substances to a moderately fine powder.

Note—Bayberry root bark is derived from *Myrica cerifera* Linné (Waxmyrtle; Candleberry).

318. PULVIS PANCREATICUS COMPOSITUS.

Compound Pancreatic Powder.

Peptonizing Powder.

Pancreatin (N. F.)	5 grains.
Bicarbonate of Sodium	20 “

Mix them by trituration.

Note.—If Pancreatin of proper strength (see No. 278) is not available, any other commercial preparation of the pancreas, as, for instance, the extract, may be used in place of it, provided it attains the required standard.

The quantities above given are sufficient to peptonize 1 pint of fresh cow's milk, by proceeding in the following manner:

Add the Compound Pancreatic Powder to 4 fluidounces of tepid Water, contained in a suitable flask, and afterwards add 1 pint of fresh cow's Milk, previously heated to 38° C. (100.4° F.). Maintain the mixture at this temperature during thirty minutes, then transfer the flask to a cold place.

Milk thus peptonized should not be used when it has been kept over twenty-four hours, or when it has developed a bitter taste.

319. PULVIS PEPSINI COMPOSITUS.

Compound Powder of Pepsin.

Pulvis Digestivus.

Saccharated Pepsin	150 grains.
Pancreatin (N. F.)	150 "
Diastase	10 "
Lactic Acid	10 minims.
Hydrochloric Acid	20 "
Sugar of Milk . . . . enough to make	1000 grains.

Add the Acids gradually to the Sugar of Milk, and triturate until they are thoroughly mixed. Mix the Pepsin, Pancreatin and Diastase, and then incorporate this mixture, by trituration, with the Sugar of Milk. Finally, rub the mixture through a hair-sieve, and preserve the powder in bottles.

Note.—The best commercial variety of Diastase, capable of converting the largest comparative amount of starch into dextrin and glucose, should be used for this preparation.

320. PULVIS RHEI ET MAGNESIÆ ANISATUS.

Anisated Powder of Rhubarb and Magnesia.

Compound Anise Powder.

Rhubarb, in fine powder	1 troy ounce.
Heavy Magnesia, calcined	2 troy ounces.
Oil of Anise	110 minims.
Alcohol	160 "

Mix the powders, add the Oil of Anise previously dissolved in the Alcohol, and triturate until a uniform mixture results.

321. PULVIS TALCI SALICYLICUS.

Salicylated Powder of Talcum.

Salicylic Acid	3 parts.
Boric Acid, in fine powder	10 "
Talcum, in fine powder	87 "

Mix them intimately.

Note.—The corresponding preparation of the Germ. Pharm. has the title *Pulvis Salicylicus cum Talco*, and contains 10 parts of Wheat Starch in place of Boric Acid.

322. SAL CAROLINUM FACTITIUM.

Artificial Carlsbad Salt.

I. *In a dry, amorphous form* (Germ. Pharm.).

Sulphate of Potassium	2 parts.
Chloride of Sodium	18 "
Bicarbonate of Sodium	36 "
Sulphate of Sodium, dried	44 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

Note.—The dried Sulphate of Sodium is prepared by slowly drying the crystalline salt until it has lost one-half of its weight.

II. *In a crystalline form.*

Sulphate of Potassium	2 parts.
Chloride of Sodium	18 "
Carbonate of Sodium, in clear crystals	61 "
Sulphate of Sodium, crystallized	88 "
Distilled Water	50 "

Dissolve the Sulphate of Potassium and Chloride of Sodium in the Distilled Water, and add this solution to the other two salts, previously melted in a tared capsule and at a gentle heat in their own water of crystallization. Evaporate the mixture to about *one hundred and eighty* (180) *parts*, set it aside in a cool place, and stir frequently, so as to prevent the formation of large crystals, taking care, however, that none of the salt separate in a pulverulent form. Distribute any remaining water of crystallization uniformly over the crystals, and dry the whole mixture sufficiently by exposure to air, so that it will retain its crystalline character.

A solution of about 16 grains of the dry, or about 27 grains of the crystalline salt, in 6 fluidounces of water, represents an equal volume of Carlsbad Water (Sprudel) in its essential constituents.

Note.—The salts employed in the preparation of the crystalline form, must have been purified by recrystallization.

323. SAL CAROLINUM FACTITIUM EFFERVESCENS.

Artificial Effervescent Carlsbad Salt.

Artificial Carlsbad Salt, in form of dry powder	320 parts.
Bicarbonate of Sodium	630 "
Tartaric Acid	560 "
Sugar, in very fine powder	240 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

A solution of about 87 grains of this preparation, in 6 fluidounces of water, represents an equal volume of Carlsbad Water (Sprudel), in its essential constituents.

324. SAL KISSINGENSE FACTITIUM.

Artificial Kissingen Salt.

Chloride of Potassium	17 parts.
Chloride of Sodium	357 "
Sulphate of Magnesium, anhydrous	59 "
Bicarbonate of Sodium	107 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

A solution of about 24 grains of this preparation, in 6 fluidounces of water, represents an equal volume of Kissingen Water (Rakoczi Spring) in its essential constituents.

325. SAL KISSINGENSE FACTITIUM EFFERVESCENS.

Effervescent Artificial Kissingen Salt.

Artificial Kissingen Salt	540 parts.
Bicarbonate of Sodium	540 "
Tartaric Acid	480 "
Sugar, in very fine powder	240 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

A solution of about 80 grains of this preparation, in 6 fluidounces of water, represents an equal volume of Kissingen Water (Rakoczi Spring) in its essential constituents.

326. SAL VICHYANUM FACTITIUM.

Artificial Vichy Salt.

Bicarbonate of Sodium	352 parts.
Carbonate of Potassium	16 "
Sulphate of Magnesium, anhydrous	16 "
Chloride of Sodium	32 "

Triturate the ingredients, previously well dried, to a fine, uniform powder.

A solution of about 14 grains of this preparation, in 6 fluidounces of water, represents an equal volume of Vichy Water (Grande Grille Spring) in its essential constituents.

327. SAL VICHYANUM FACTITIUM EFFERVESCENS.

Artificial Effervescent Vichy Salt.

Artificial Vichy Salt	430	parts.
Bicarbonate of Sodium	570	“
Tartaric Acid	510	“
Sugar, in very fine powder	240	“

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

A solution of about 57 grains of this preparation, in 6 fluidounces of water, represents an equal volume of Vichy Water (Grande Grille Spring), in its essential constituents.

328. SAL VICHYANUM FACTITIUM EFFERVESCENS, CUM LITHIO.

Artificial Effervescent Vichy Salt with Lithium.

Artificial Vichy Salt	280	parts.
Citrate of Lithium	100	“
Bicarbonate of Sodium	610	“
Tartaric Acid	540	“
Sugar	270	“

Triturate the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of this preparation represent 14 grains of Artificial Vichy Salt and 5 grains of Citrate of Lithium.

329. SAPO VIRIDIS.

Green Soap.

Potassa	8	parts.
Water	12	“
Cotton Seed Oil	24	“

Dissolve the Potassa in the Water, and while stirring the solution, add the Cotton Seed Oil. Stir it occasionally during forty-eight hours, then transfer the product to suitable vessels.

Note.—If refined Cotton Seed Oil is used for this preparation, the product will have a yellowish color, free from greenish tint, but will answer the same purpose.

330 SODA CUM CALCE.

Soda with Lime.

London Paste.

Soda,	
Lime, each	equal parts.

Reduce them to powder in a clean iron mortar, previously warmed, and mix them intimately. Keep the powder in small well-stoppered vials.

331. SODII BORO-BENZOAS.

Boro-Benzoate of Sodium.

Borate of Sodium, in fine powder	3 parts.
Benzoate of Sodium	4 "

Mix them intimately.

332. SPECIES EMOLLIENTES.

Emollient Species.

Emollient Cataplasm. (Germ. Pharm.).

Althæa Leaves,	
Mallow Leaves,	
Melilot Tops,	
Matricaria,	
Flaxseed, each	equal parts.

Reduce them to a coarse powder, and mix it uniformly.

Note.—Mallow Leaves are derived from *Malva vulgaris* Fries and *Malva sylvestris* Linné. Melilot Tops are the leaves and flowering branches of *Melilotus officinalis* Desrousseaux, and *Melilotus altissimus* Thuilliers.

333. SPECIES LAXANTES.

Laxative Species.

St. Germain Tea. (Germ. Pharm.).

Senna, cut	16 parts.
Elder Flowers	10 "
Fennel, bruised	5 "
Anise, bruised	5 "
Bitartrate of Potassium, in fine powder	4 "

Moisten the Senna with a small quantity of water; then sprinkle over it, as uniformly as possible, the Bitartrate of Potassium. When it has become dry, mix it lightly and uniformly with the other ingredients.

334. SPECIES PECTORALES.

Pectoral Species.

Species ad Infusum Pectorale. Breast Tea. (Germ. Pharm.).

Althæa, peeled	8 parts.
Coltsfoot Leaves	4 "
Glycyrrhiza, Russian, peeled	3 "
Anise	2 "
Mullein Flowers	2 "
Orris Root	1 "

Cut, bruise and mix them.

Note.—Coltsfoot Leaves are derived from *Tussilago Farfara* Linné. Mullein Flowers are from *Verbascum Thapsus* G. Meyer.

Infusum pectorale (Pectoral Infusion, or Infusion of Pectoral Species) is made by infusing 1 troy ounce of the above preparation, in the usual manner, so as to obtain 10 fluidounces of strained product.

335. SPIRITUS ACIDI FORMICI.

Spirit of Formic Acid.

Spiritus Formicarum (Germ. Pharm.). *Spirit of Ants.*

Formic Acid	250 minims.
Distilled Water	3½ fluidounces.
Alcohol	enough to make 16 "

Mix the Formic Acid with the Distilled Water, and add enough Alcohol to make *sixteen* (16) *fluidounces.*

Note.—Formic Acid is required by the Germ. Pharm. to have a specific gravity of 1.060 to 1.063.

336. SPIRITUS AMYGDALÆ AMARÆ.

Spirit of Bitter Almond.

Essence of Bitter Almond.

Oil of Bitter Almond	160 minims.
Alcohol	14 fluidounces.
Distilled Water	enough to make 16 "

Dissolve the Oil in the Alcohol, and add enough Distilled Water to make *sixteen* (16) *fluidounces.*

337. SPIRITUS AROMATICUS.

Aromatic Spirit.

Compound Spirit of Orange (N. F.)	8 fluidounces.
Deodorized Alcohol	7½ pints.

Mix them. Preserve the product, if it is to be kept in stock, in completely filled and well-stoppered vials or bottles, and stored in a cool and dark place.

Aromatic Spirit may also be prepared in the following manner:

Sweet Orange Peel, fresh, and deprived of the white, inner portion		16 troy ounces.
Lemon Peel, fresh		2 " "
Coriander, bruised		2 " "
Oil of Staranise		16 minims.
Deodorized Alcohol	enough to make	1 gallon.

Macerate the solids during four days with 1 gallon of Deodorized Alcohol; then add the Oil of Staranise, filter, and pass enough Deodorized Alcohol through the filter to make the product measure *one* (1) *gallon*.

Note.—When good, fresh essential oils cannot be readily obtained for preparing the Compound Spirit of Orange, the second formula may be used. But the product obtained by it should not be employed in mixtures containing *iron*, as the latter would cause a darkening of the mixture.

338. SPIRITUS AURANTII COMPOSITUS.

Compound Spirit of Orange.

Oil of Bitter Orange Peel		4 fluidounces.
Oil of Lemon		1 fluidounce.
Oil of Coriander		160 minims.
Oil of Staranise		40 "
Deodorized Alcohol	enough to make	20 fluidounces.

Mix them.

Note.—One fluidounce of this Spirit and 15 fluidounces of Deodorized Alcohol, make 1 pint of Aromatic Spirit. (See No. 337).

The essential oils used in this preparation, particularly those of orange and lemon, must be as fresh as possible, and *absolutely free* from any terebinthinate odor or taste. They should be diluted as soon as received, with a definite quantity of Deodorized Alcohol, which will retard deterioration. They should not be kept in stock, undiluted, for any length of time, or should at least be kept in bottles completely filled, and in a dark place. The alcoholic solution should be kept in the same manner. If Oil of Curaçao Orange of good quality can be obtained, it is advisable to use this, in place of ordinary oil of orange, as it imparts to the Spirit a finer flavor.

339. SPIRITUS CARDAMOMI COMPOSITUS.

Compound Spirit of Cardamom.

Oil of Cardamom		12 minims.
Oil of Caraway		4 "
Oil of Cinnamon, Cassia		2 "
Alcohol		8 fluidounces.
Glycerin		1 fluidounce.
Water	enough to make	16 fluidounces.

Dissolve the Oils in the Alcohol, add the Glycerin, and lastly, enough Water to make *sixteen* (16) *fluidounces*.

Note.—This preparation is intended as a flavoring ingredient, being equivalent to the officinal *Tinctura Cardamomi Composita*, without the coloring matter.

340. SPIRITUS CURASSAO.

Spirit of Curaçao.

Oil of Curaçao Orange	2 fluidounces.
Oil of Fennel	15 minims.
Oil of Bitter Almond	3 "
Deodorized Alcohol	10 fluidounces.

Mix the Oils with the Deodorized Alcohol, and keep the Spirit in completely filled and well-corked bottles, and stored in a cool and dark place.

Note.—The essential oils used in this case must be as fresh as possible, and *absolutely free* from any terebinthinate odor or taste. Oil of Curaçao Orange may be obtained without difficulty in the market, but it should be carefully examined as to its quality, immediately upon receipt, and should not be kept in stock, for any length of time, without special precautions (see Note to No. 338). A still finer quality of Oil of Orange is that derived from Citrus nobilis, which is known in the market as Oil of Mandarin.

341. SPIRITUS GLONOINI.

Spirit of Glonoin.

Spirit of Nitroglycerin. Solution of Nitroglycerin.

A solution of Glonoin (or Nitroglycerin) in officinal Alcohol, containing *one* (1) *per cent.*, by weight, of the former.

Note.—The specific gravity of this Spirit, at 15° C. (59° F.) is 0.828. On mixing 10 C.c. of the Solution with Distilled Water, in a test-tube having a diameter of ¾ inch, both liquids being at the temperature of 15° C. (59° F.), it will require about 16 C.c. of the Water to render the liquid faintly turbid (when compared with the undiluted Solution); and about 4 C.c. more of Water will be required to render it so opalescent that the eye cannot distinguish print placed behind the tube.

Glonoin (or Nitroglycerin), for medical purposes, is usually procured by wholesale dealers in drugs directly from the factory where it is made, in form of a 10 per cent. solution in alcohol. Such a solution is non-explosive, and may be diluted, as occasion requires, to the strength of 1 per cent. The specific gravity of the 10 per cent. solution is 0.863 at 15° C. (59° F.). Ten C.c. of it require about 2.5 C.c. of Distilled Water to render it so opalescent that print cannot be distinguished through it under the conditions just described in the case of the 1 per cent. solution.

Solutions of Glonoin, particularly the stronger (10 per cent.), should always be transported or kept in tin cans, and *never in glass* or other fragile vessels. Should the container of a Solution of Glonoin be broken, and the contents be soaked up by wood, or packing material, the latter may become dangerously explosive when the alcohol has evaporated. Should the proportion of glonoin to porous material be not more than 70 parts of the former, and not less than 30 parts of the latter, the compound will be non-explosive (except by a detonator); and if the proportions are not more than 52 parts of the former, and not less than 48 parts of the latter, the compound cannot even be detonated. But, in presence of substances readily yielding oxygen, such as nitrates, chlorates, etc., so small a proportion as 5 per cent. of glonoin will produce a dangerously explosive combination.

When handling an alcoholic solution of Glonoin, care should be taken that it be not brought in prolonged or extended contact with the skin, as it is readily absorbed, and will then cause its characteristic physiological effects (distressing headache, nausea, etc.).

342. SPIRITUS OLEI VOLATILIS.

Spirit of a Volatile Oil.

Any Spirit or alcoholic Solution of a Volatile Oil, for which no formula is given by the U. S. Pharm. or by this Formulary, should be prepared in accordance with the following general formula:

Any Volatile Oil	400 minims.
Deodorized Alcohol . . . . enough to make	16 fluidounces.

Dissolve the Volatile Oil in the Deodorized Alcohol.

Note.—The strength of the Spirit thus prepared is approximately 5 per cent. by weight, provided the specific gravity of the Oil is in the neighborhood of 0.900.

343. SPIRITUS OPHTHALMICUS.

Ophthalmic Spirit.

Alcoholic Eye-Wash.

Oil of Lavender	10 minims.
Oil of Rosemary	30 "
Alcohol	1 fluidounce.

Mix them by agitation, and, if necessary, filter the liquid through paper.

344. SPIRITUS PHOSPHORI.

Spirit of Phosphorus.

Tincture of Phosphorus.

Phosphorus	10 grains.
Absolute Alcohol . . . . enough to make	15 fluidounces.

To the Absolute Alcohol, contained in a flask, add the Phosphorus, cut into small pieces, and apply a moderate heat, by means of a water-bath, taking care to prevent, as much as possible, any loss of alcohol by evaporation, or making up any loss by adding, from time to time, a little more Absolute Alcohol. When the Phosphorus is dissolved, allow the liquid to become cold, and add enough Absolute Alcohol, if necessary, to make *fifteen* (15) *fluidounces.* Then transfer the Spirit to small, dark amber-colored vials, stopper them securely, and keep them in a cool and dark place.

Each fluidrachm contains $\frac{1}{12}$ *grain of Phosphorus; or, 14.4 minims contain* $\frac{1}{50}$ *grain of Phosphorus.*

Note.—The Phosphorus should be perfectly translucent, cut and weighed under water, and quickly dried with filtering paper, before being dropped into the Alcohol. The loss of alcohol, during the heating, may be avoided, and solution effected more expeditiously, by attaching to the flask a well-cooled upright condenser, which will cause the vapor of the alcohol to be condensed, and to flow back into the flask. In the absence of a condenser, a long glass tube, inserted through a tight-fitting cork into the neck of the flask, and maintained in an upright position, will nearly answer the same purpose.

This preparation is intended for preparing the Elixir of Phosphorus (see No. 85). It is unsuited for internal administration without corrigents. Care should be taken that it be not confounded with Thompson's Solution of Phosphorus (see *Liquor Phosphori*, No. 228).

345. SPIRITUS SAPONATUS.

Spirit of Soap.

Castile Soap, in shavings	2½ troy ounces.
Alcohol	9 fluidounces.
Water . . . enough to make	16 "

Introduce the Soap into a bottle, add the Alcohol and *three* (3) *fluidounces* of Water, cork the bottle, and immerse it in hot Water, frequently shaking. When the Soap is dissolved, allow the bottle and contents to become cold, then add enough Water to make *sixteen* (16) *fluidounces*, and filter.

Note.—The *Spiritus Saponatus* of the Germ. Pharm. is prepared by saponifying Olive Oil with Potassa, and then adding Alcohol and Water.

If time permits, the Spirit ought to be set aside, in a moderately cold place, for about twelve hours, before it is filtered.

346. SPIRITUS SINAPIS.

Spirit of Mustard.

Volatile Oil of Mustard	190 minims.
Alcohol . . . enough to make	16 fluidounces.

Mix them.

Note.—This preparation is officinal in the Germ. Pharm.

347. SPONGIA COMPRESSA.

Compressed Sponge.

Sponge Tent.

Sponge	a sufficient quantity.
Mucilage of Acacia	1 volume.
Water	9 volumes.

Mix a sufficient quantity of Mucilage of Acacia and of Water, in the proportion of *one* (1) *volume* of the former to *nine* (9) *volumes* of the latter, and immerse in the liquid the Sponge, previously freed from sand and other obvious impurities, and cut into suitable pieces. When the Sponge has been thoroughly impregnated, firmly wrap twine around it so as to bring it to the desired shape, and then dry it.

Note.—Sponge thus prepared is best preserved with the twine wrapped around it. If the twine is removed, special care must be taken to protect the Sponge against damp air.

348. SPONGIA DECOLORATA.

Decolorized Sponge.

Bleached Sponge.

Sponge,	
Permanganate of Potassium,	
Hyposulphite of Sodium,	
Hydrochloric Acid,	
Water	each a sufficient quantity.

Free the Sponge from sand and any other obvious impurities or damaged portions by beating, washing and trimming, then soak it for about fifteen minutes in a sufficient quantity of Solution of Permanganate of Potassium, containing *one hundred and twenty* (120) *grains* to the *pint*, wringing the Sponge out occasionally and replacing it in the liquid. Then remove it and wash it with Water, until the latter runs off colorless. Wring out the Water, and then place the Sponge into a Solution of Hyposulphite of Sodium containing *one* (1) *troy ounce* to the *pint*. Next add for every *pint* of the last-named solution used, *one* (1) *fluidounce* of Hydrochloric Acid diluted with *four* (4) *fluidounces* of Water. Macerate the Sponge in the liquid for about fifteen minutes, expressing it frequently and replacing it in the liquid. Then remove it, wash it thoroughly with Water, and dry it. In the case of large and dark-colored sponges, this treatment may be repeated until the color has been removed as far as possible.

Note.—If it is desired to keep the Sponge soft, and to prevent it from shrinking when dry, it may be dipped, after having been finally washed, into a mixture of 1 volume of Glycerin and 5 volumes of Water, after which it is to be wrung out and allowed to dry.

349. SUCCUS LIMONIS CUM PEPSINO.

Lime Juice and Pepsin.

Pepsin (N. F.)		256 grains.
Water		3 fluidounces.
Glycerin		3 "
Alcohol		1½ "
Purified Talcum		120 grains.
Lime Juice	enough to make	16 fluidounces.

Dissolve the Pepsin in the Water, mixed with about *eight* (8) *fluidounces* of Lime Juice. Then add the Glycerin and Alcohol, and lastly, enough Lime Juice to make *sixteen* (16) *fluidounces*. Incorporate the Purified Talcum with the liquid, let it stand a few days in a cold place, if convenient, occasionally agitating, then filter it through a wetted filter, and finally pass enough Lime Juice through the filter to restore the original volume.

Each fluidrachm represents 2 grains of Pepsin (N. F.).

350. SYRUPUS ACIDI HYDRIODICI DECOLOR.

Colorless Syrup of Hydriodic Acid.

Iodide of Potassium		123	grains.
Hypophosphite of Potassium		3	"
Tartaric Acid		112	"
Water		½	fluidounce.
Diluted Alcohol		1	"
Syrup	enough to make	16	fluidounces.

Dissolve the Iodide and Hypophosphite of Potassium in *one-half* (½) *fluidounce* of Water, and the Tartaric Acid in *one-half* (½) *fluidounce* of Diluted Alcohol. Mix the two solutions in a vial, cork and shake it well, and then place it in ice-water for about half an hour, or longer, if convenient; again shake it thoroughly, and then pour the mixture upon a small white filter contained in a funnel, the stem of which dips below the surface of *fourteen* (14) *fluidounces* of Syrup contained in a bottle. When the liquid has run through, wash the vial and filter with *one-half* (½) *fluidounce* of Diluted Alcohol, added in several portions. Then add enough Syrup to make *sixteen* (16) *fluidounces*. Keep the product in well-stoppered bottles.

Note.—This preparation is of about the same strength, volume for volume, but not weight for weight, as the officinal *Syrupus Acidi Hydriodici*.

351. SYRUPUS ACTÆÆ COMPOSITUS.

Compound Syrup of Actæa.

Compound Syrup of Cimicifuga (or *Black Cohosh*).

Fluid Extract of Cimicifuga		300	minims.
Fluid Extract of Glycyrrhiza		150	"
Fluid Extract of Senega		150	"
Fluid Extract of Ipecac		75	"
Wild Cherry, in moderately fine powder		300	grains.
Purified Talcum		120	"
Sugar		10	troy ounces.
Water	enough to make	16	fluidounces.

Mix the Wild Cherry with *six* (6) *fluidounces* of Water, and allow it to macerate during one hour. Then add to it the Fluid Extracts and the Talcum, and stir or agitate the mixture frequently and thoroughly during about fifteen minutes. Transfer it to a wetted filter and, when the liquid ceases to drop from the funnel, wash the contents of the filter with Water to obtain *eight* (8) *fluidounces* of filtrate. In this dissolve the Sugar by agitation, and add enough Water, previously passed through the filter, to make *sixteen* (16) *fluidounces*.

352. SYRUPUS ASARI COMPOSITUS.

Compound Syrup of Asarum.

Compound Syrup of Canada Snake-Root.

Asarum root, in moderately coarse (No. 40) powder		448 grains.
Alcohol		3 fluidounces.
Cochineal, in fine powder		10 grains.
Carbonate of Potassium		20 "
Wine of Ipecac		220 minims.
Sugar		11 troy ounces.
Water	enough to make	16 fluidounces.

Mix the Asarum intimately with the Cochineal and Carbonate of Potassium, previously triturated together. Moisten the powder with a sufficient quantity of a menstruum prepared by mixing the Alcohol with *six* (6) *fluidounces* of Water, and allow it to macerate, in a covered vessel, for twenty-four hours. Then transfer it to a small percolator, and pour on the remainder of the menstruum. Allow the percolation to proceed slowly, and then follow up the menstruum by Water, until *eight* (8) *fluidounces* of percolate are obtained. To this add the Wine of Ipecac, and afterwards the Sugar, and dissolve the latter by agitation. Finally, add enough Water, previously passed through the percolator, to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents about 3½ *grains of Asarum.*

353. SYRUPUS COFFEÆ.

Syrup of Coffee.

Coffee, roasted	8 troy ounces.
Sugar	24 " "
Water	a sufficient quantity.

Introduce the Coffee, reduced to a moderately coarse powder, into a suitable vessel; pour upon it *sixteen* (16) *fluidounces* of boiling Water, then cover it well, and boil for five minutes. Allow it to become cold, keeping the vessel well covered; strain off the liquid and pass enough Water through the strainer to make the strained liquid, when cold, measure *sixteen* (16) *fluidounces.* In this dissolve the Sugar, by agitation, without heat, and strain through muslin.

Note.—It is recommended that a mixture of equal parts of the commercial varieties of Coffee, known as "Java" and "Mocha," be employed for this purpose. The coffee may also be exhausted by percolation, but special arrangements are then necessary to maintain the menstruum at the proper temperature.

354. SYRUPUS CALCII CHLORHYDROPHOSPHATIS.

Syrup of Chlorhydrophosphate of Calcium.

Syrup of Chlorhydrophosphate of Lime.

Precipitated Phosphate of Calcium	128	grains.
Hydrochloric Acid, Water, each	a sufficient quantity.	
Spirit of Lemon	140	minims.
Syrup . . . enough to make	16	fluidounces.

Triturate the Precipitated Phosphate of Calcium with *one* (1) *fluidounce* of Water, and dissolve it with the aid of Hydrochloric Acid, avoiding an excess. Then add the Spirit of Lemon, filter the liquid, and wash the filter with a mixture of *one* (1) *fluidounce*, each, of Water and of Syrup. Lastly, add enough Syrup to the filtrate, to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains 1 grain of Phosphate of Calcium.

355. SYRUPUS CALCII ET SODII HYPOPHOSPHITUM.

Syrup of Hypophosphite of Calcium and Sodium.

Syrup of Hypophosphite of Lime and Soda.

Hypophosphite of Calcium	256	grains.
Hypophosphite of Sodium	256	"
Citric Acid	10	"
Sugar	12	troy ounces.
Water . . . enough to make	16	fluidounces.

Dissolve the two Hypophosphites and the Citric Acid in *eight* (8) *fluidounces* of Water, filter the solution, add the Sugar to the filtrate, and pass enough Water through the filter to make the product, after the Sugar has been dissolved by agitation, measure *sixteen* (16) *fluidounces*.

Each fluidrachm contains 2 grains, each, of Hypophosphite of Calcium and Hypophosphite of Sodium.

356. SYRUPUS CALCII HYPOPHOSPHITIS.

Syrup of Hypophosphite of Calcium.

Syrup of Hypophosphite of Lime.

Hypophosphite of Calcium	256	grains.
Citric Acid	10	"
Sugar	12	troy ounces.
Water . . . enough to make	16	fluidounces.

Dissolve the Hypophosphite of Calcium and the Citric Acid in *eight* (8) *fluidounces* of Water, filter the solution, add the Sugar to the filtrate, and pass enough Water through the filter to make the product, after the Sugar has been dissolved by agitation, measure *sixteen* (16) *fluidounces*.

Each fluidrachm contains 2 grains of Hypophosphite of Calcium.

357. SYRUPUS CALCII IODIDI.

Syrup of Iodide of Calcium.

Iodine	552 grains.
Iron Wire, fine, bright, and finely cut	200 "
Precipitated Carbonate of Calcium	250 "
Distilled Water	a sufficient quantity.
Sugar	11 troy ounces.
Syrup, enough to make	16 fluidounces.

Mix the Iron Wire with *four hundred and fourteen* (414) *grains* of the Iodine and *three* (3) *fluidounces* of Distilled Water, and apply a gentle heat, until the Iodine is combined, and the liquid has acquired a greenish color. Filter the liquid through a small filter into a flask containing the remainder of the Iodine, wash the filter with *one* (1) *fluidounce* of Distilled Water, and heat the solution gently, taking care that no iodine is lost by evaporation. Heat *four* (4) *fluidounces* of Distilled Water in a capacious capsule to boiling, and add to it small alternate portions, first of the Precipitated Carbonate of Calcium, and then of the solution of Iodide of Iron, in small portions at a time, stirring briskly and waiting until the violence of the reaction moderates before adding a fresh portion. From time to time, add a little Distilled Water, to replace that lost by evaporation. When all the Iron solution has been added, continue heating the mixture until it is quietly boiling, then filter it through a wetted filter, and wash the latter with enough Distilled Water to make the product, when cold, measure *eight* (8) *fluidounces*. In this dissolve the Sugar by agitation, then make up the volume with Syrup to *sixteen* (16) *fluidounces*, and strain, if necessary.

Each fluidrachm contains about 5 grains of Iodide of Calcium.

358. SYRUPUS CALCII LACTOPHOSPHATIS CUM FERRO.

Syrup of Lactophosphate of Calcium with Iron.

Syrup of Lactophosphate of Lime with Iron.

Lactate of Iron	64 grains.
Citrate of Potassium	64 "
Water	1 fluidounce.
Syrup of Lactophosphate of Calcium (U. S. P.), enough to make	16 fluidounces.

Dissolve the Lactate of Iron and Citrate of Potassium in the Water with the aid of heat, and add enough Syrup of Lactophosphate of Calcium to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains ½ grain of Lactate of Iron and about ¼ grain of Lactate of Calcium (or about ⅜ grain of so-called Lactophosphate of Calcium).

359. SYRUPUS CHONDRI COMPOSITUS.

Compound Syrup of Chondrus.

Compound Syrup of Irish Moss.

Irish Moss	8	grains.
Fluid Extract of Ipecac	8	minims.
Fluid Extract of Squill	120	"
Fluid Extract of Senega	120	"
Camphorated Tincture of Opium	210	"
Purified Talcum	120	grains.
Sugar	10	troy ounces.
Water . . . enough to make	16	fluidounces.

Macerate the Irish Moss in *one* (1) *fluidounce* of Water until it is softened, then heat it on a boiling water-bath for fifteen minutes, strain it through flannel, without pressure, and wash the flannel and contents with *one* (1) *fluidounce* of hot Water. Mix the Fluid Extracts and Tincture with the Purified Talcum and *five* (5) *fluidounces* of Water, shake the mixture frequently and thoroughly during half an hour, and then filter it through a wetted filter, returning the first portions of the filtrate until it runs through clear. Mix the mucilage of Irish Moss with the filtrate, then add the Sugar, and pass enough Water through the filter, to make the product, after the Sugar has been dissolved by agitation, measure *sixteen* (16) *fluidounces.*

360. SYRUPUS CINNAMOMI.

Syrup of Cinnamon.

Cinnamon (Cassia), in moderately coarse powder	1½	troy ounces.
Alcohol	360	minims.
Sugar	11	troy ounces.
Cinnamon Water . . . enough to make	16	fluidounces.

Mix the Alcohol with *seven* (7) *fluidounces* of Cinnamon Water, moisten the Cinnamon with a sufficient quantity of this menstruum and allow it to macerate for about two hours. Then transfer it to a small percolator, and percolate, in the usual manner, using first the remainder of the menstruum above directed, and afterwards, Cinnamon Water. Collect the first *eight* (8) *fluidounces* of the percolate separately, and dissolve in it the Sugar. Then collect an additional quantity of percolate and add it to the Syrup, so as to make *sixteen* (16) *fluidounces.*

Note.—This preparation is practically identical with that officinal in the Germ. Pharm.

361. SYRUPUS ERIODICTYI AROMATICUS.

Aromatic Syrup of Eriodictyon.

Aromatic Syrup of Yerba Santa. Syrupus Corrigens.

Fluid Extract of Eriodictyon	½ fluidounce
Solution of Potassa	180 minims.
Compound Tincture of Cardamom	1 fluidounce.
Oil of Sassafras	4 drops.
Oil of Lemon	4 "
Oil of Cloves	8 "
Alcohol	½ fluidounce.
Sugar	13 troy ounces.
Water	enough to make 16 fluidounces.

Mix the Fluid Extract of Eriodictyon and Solution of Potassa, then add *one and one-half* (1½) *fluidounces* of Water previously mixed with the Compound Tincture of Cardamom, and afterwards add the Oils dissolved in the Alcohol. Shake the mixture thoroughly, then filter it, and pour enough Water through the filter to obtain *six* (6) *fluidounces* of filtrate. Pour this upon the Sugar contained in a bottle, and dissolve it by placing the bottle in hot water, frequently agitating. Lastly, cool the product and add enough Water, passed through the filter previously used, to make *sixteen* (16) *fluidounces.*

Note.—This preparation is chiefly intended as a vehicle, for disguising the taste of quinine or of other bitter substances. (Compare No. 54).

362. SYRUPUS FERRI ARSENIATIS.

Syrup of Arseniate of Iron.

Arseniate of Sodium (U. S. P.), dried to a constant weight at a heat not exceeding 149° C. (300° F.)	3 grains.
Citrate of Iron (U. S. P.)	2½ "
Water	½ fluidounce.
Syrup	enough to make 16 fluidounces.

Dissolve the Arseniate of Sodium and Citrate of Iron in the Water, contained in a test-tube, by the aid of heat. Then mix the solution with enough Syrup to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains about $\frac{1}{60}$ grain of Arseniate of Iron (ferric).

Note.—Care should be taken to select perfectly formed crystals of Arseniate of Sodium, which must then be dried completely at 100° C. (212° F.), and the 3 grains required for the above formula must be weighed from the *dried* salt. It is advisable to dry a fresh quantity of the salt each time the above Syrup is to be prepared.

363. SYRUPUS FERRI CITRO-IODIDI.

Syrup of Citro-Iodide of Iron.

Tasteless Syrup of Iodide of Iron.

Iodine	400 grains.
Iron Wire, fine, bright, and finely cut	200 "
Citrate of Potassium	620 "
Sugar	10 troy ounces.
Distilled Water	enough to make 16 fluidounces.

Mix the Iron with *four* (4) *fluidounces* of Distilled Water in a flask, add *two hundred and sixty-seven* (267) *grains* of the Iodine, and apply a gentle heat until the Iodine is combined and the solution has acquired a greenish color. Then heat the contents of the flask to boiling, filter the liquid, and wash the filter with *one-half* (½) *fluidounce* of hot Distilled Water. To the hot filtrate add the Citrate of Potassium, and afterwards the remainder of the Iodine, and agitate until the liquid has assumed a greenish color. Pour this upon the Sugar contained in a bottle, agitate until solution has been effected, and when the liquid is cold, add enough Distilled Water to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains an amount of Iron, corresponding to about 3.6 grains of Ferric Iodide.

Note.—The officinal *Syrupus Ferri Iodidi* contains about 8 grains of *ferrous iodide* (protiodide of iron) in each fluidrachm. The above preparation contains the iron in the *ferric* condition.

364. SYRUPUS FERRI ET MANGANI IODIDI.

Syrup of Iodide of Iron and Manganese.

Iodine	595 grains.
Iron Wire, fine, bright, and finely cut	192 "
Sulphate of Manganese	192 "
Iodide of Potassium	230 "
Sugar	12 troy ounces.
Distilled Water	enough to make 16 fluidounces.

Mix the Iron with *four* (4) *fluidounces* of Distilled Water in a flask, add the Iodine, and prepare a solution of ferrous iodide, in the usual manner, aiding the process, if necessary, by heating the contents of the flask, at first gently, and finally to boiling. Filter the liquid, through a small filter, directly upon the Sugar, contained in a suitable bottle. Dissolve the Sulphate of Manganese in *two* (2) *fluidounces* of Distilled Water, and the Iodide of Potassium in *two* (2) *fluidounces* of Diluted Alcohol, mix the two solutions and filter into the same bottle which contains the Sugar and the Iron solution. Wash the filter with *one-half* (½) *fluidounce* of cold Distilled Water, receiving the washings in the same bottle. Agitate until the Sugar is dissolved, and, if necessary, strain. Finally, make up the volume with Distilled Water to *sixteen* (16) *fluidounces*.

Each fluidrachm contains about 6 grains of Iodide of Iron (ferrous) and 3 grains of Iodide of Manganese.

365. SYRUPUS FERRI HYPOPHOSPHITIS.

Syrup of Hypophosphite of Iron.

Hypophosphite of Iron	128 grains.
Citrate of Potassium	160 “
Orange Flower Water	1 fluidounce.
Syrup enough to make	16 fluidounces.

Dissolve the Hypophosphite of Iron, with the aid of the Citrate of Potassium, in the Orange Flower Water, and add enough Syrup to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains 1 grain of Hypophosphite of Iron (ferric).

366. SYRUPUS FERRI LACTOPHOSPHATIS.

Syrup of Lactophosphate of Iron.

Lactate of Iron	128 grains.
Phosphoric Acid (50%)	a sufficient quantity.
Water	½ fluidounce.
Syrup enough to make	16 fluidounces.

Dissolve the Lactate of Iron in the Water with the aid of a sufficient quantity of Phosphoric Acid, avoiding an excess, and add enough Syrup to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains 1 grain of Lactate of Iron, or about 1½ grains of so-called Lactophosphate of Iron.

367. SYRUPUS FERRI PROTOCHLORIDI.

Syrup of Protochloride of Iron.

Syrup of Ferrous Chloride.

Solution of Protochloride of Iron	384 minims.
Glycerin	2 fluidounces.
Orange Flower Water	2 “
Syrup enough to make	16 “

Mix the Solution of Protochloride of Iron with the Glycerin and Orange Flower Water, and add enough Syrup to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains about 1 grain of Protochloride of Iron (ferrous chloride).

368. SYRUPUS FERRI SACCHARATI SOLUBILIS.

Syrup of Soluble Saccharated Iron.

Syrupus Ferri Oxydati Solubilis (Germ. Pharm.). *Syrup of Saccharated Oxide of Iron. Syrup of Soluble Oxide of Iron.*

1. **Solution of Chloride of Iron (U. S. P.)**	8 parts.
Soda,	
Distilled Water, each	a sufficient quantity.
Sugar	30 parts.
Syrup	enough to make 100 "

Prepare a sufficient quantity of a solution of Soda, of the specific gravity 1.160; gradually add, under stirring, *twenty-three* (23) *parts* of this to the Solution of Chloride of Iron previously mixed with *seven* (7) *parts* of Syrup, and set the mixture aside, during twenty-four hours, in a dark place. Then pour the clear liquid slowly into *one hundred and sixty* (160) *parts* of boiling Distilled Water, continue the boiling for a few minutes, and then set the mixture aside during one day, in a dark place, so that it may become clear by settling. Withdraw the supernatant liquid by means of a siphon, then wash the residue again with *one hundred and sixty* (160) *parts* of boiling Distilled Water, by decantation. Transfer the magma to a wetted strainer, and wash it with hot Distilled Water, until this runs off colorless, but so that the mass on the strainer still retains a moderately strong alkaline reaction. Then allow the excess of liquid to drain off, transfer the moist magma to a tared porcelain capsule, add the Sugar, and heat it on a water-bath, with exclusion of daylight, during two hours, replacing from time to time any Water lost by evaporation. Lastly, add enough Syrup to make the product weigh *one hundred* (100) *parts*, and transfer the product to bottles, which should be completely filled, and stored in a cool and dark place.

One hundred grains, or about 75 minims, of this Syrup represent approximately 1 grain of metallic Iron.

Note.—The above process is based upon that of the Germ. Pharm. (1st edition). The formula given by the second edition of this work presupposes the keeping in stock of a dry "Ferrum Oxydatum Saccharatum Solubile" (Saccharated Oxide of Iron), representing 3 per cent. of metallic iron. When this is available, the *Syrup of Soluble Saccharated Iron* may also be prepared by the following formula:

2. **Saccharated Oxide of Iron,**	
Syrup,	
Water, each	equal parts.

Dissolve the Saccharated Oxide of Iron in the mixed liquids.

369. SYRUPUS GLYCYRRHIZÆ.

Syrup of Glycyrrhiza.

Syrup of Liquorice.

Pure Extract of Glycyrrhiza (U. S. P.)	2 troy ounces.
Glycerin	2 " "
Sugar	10 " "
Water . . . enough to make	16 fluidounces.

Dissolve the Pure Extract of Glycyrrhiza in *eight* (8) *fluidounces* of Water, add the Sugar, dissolve it by agitation, and strain. Then add the Glycerin, and lastly, enough Water to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents about 30 grains of Glycyrrhiza.

370. SYRUPUS HYPOPHOSPHITUM COMPOSITUS.

Compound Syrup of Hypophosphites.

Compound Hypophosphites.

Hypophosphite of Calcium	256 grains.
Hypophosphite of Potassium	128 "
Hypophosphite of Sodium	128 "
Hypophosphite of Iron	16 "
Hypophosphite of Manganese	16 "
Citrate of Potassium	40 "
Citric Acid	15 "
Hydrochlorate of Quinine	8 "
Tincture of Nux Vomica (U. S. P.)	160 minims.
Sugar	12 troy ounces.
Water . . . enough to make	16 fluidounces.

Rub the Hypophosphites of Iron and of Manganese with the Citrate of Potassium and Citric Acid to powder, add *one* (1) *fluidounce* of Water, and warm the mixture a few minutes until a clear greenish solution is obtained. Introduce the other Hypophosphites and the Hydrochlorate of Quinine, previously triturated together, into a graduated bottle, next add the Sugar, the Iron and Manganese solution first prepared, the Tincture of Nux Vomica, and lastly, enough Water to make up the volume, as soon as the Sugar is saturated by the liquid, to *sixteen* (16) *fluidounces.* Agitate, until solution has been effected, and strain, if necessary.

Each fluidrachm contains 2 grains of Hypophosphite of Calcium, 1 grain, each, of the Hypophosphites of Potassium and Sodium, ⅛ grain, each, of the Hypophosphites of Iron and of Manganese, $\frac{1}{16}$ grain of Hydrochlorate of Quinine, and 1¼ minims of Tincture of Nux Vomica.

Note—This Syrup should not be confounded with the officinal *Syrupus Hypophosphitum* (Syrup of the Hypophosphites).

371. SYRUPUS IPECACUANHÆ ET OPII.

Syrup of Ipecac and Opium.

Syrup of Dover's Powder.

Fluid Extract of Ipecac	64 minims.
Deodorized Tincture of Opium (U. S. P.)	670 “
Sugar	12 troy ounces.
Cinnamon Water	enough to make 16 fluidounces.

Mix the Fluid Extract and Tincture with *six* (6) *fluidounces* of Cinnamon Water, and filter the liquid; to this add the Sugar, and enough Cinnamon Water to make the product, after the Sugar has been dissolved by agitation, measure *sixteen* (16) *fluidounces.*

Each fluidrachm represents 5 grains of Dover's Powder, or ½ grain, each, of Ipecac and Opium.

Note.—In place of the above directed quantities of Fluid Extract of Ipecac and Deodorized Tincture of Opium, 640 minims of the officinal *Tinctura Ipecacuanhæ et Opii* may be taken.

372. SYRUPUS MANNÆ.

Syrup of Manna.

Manna, in flakes	2 troy ounces.
Sugar	12 “ “
Alcohol	1 fluidounce.
Water	enough to make 16 fluidounces.

Dissolve the Manna in *seven* (7) *fluidounces* of hot Water, add the Alcohol, set the liquid aside for twelve hours in a moderately warm place, and filter. Dissolve the Sugar in the filtrate, with the aid of a gentle heat, allow the Syrup to cool, and add enough Water, passed through the filter previously used, to make *sixteen* (16) *fluidounces.*

Note.—The product is approximately of the same strength as that which is officinal in the Germ. Pharm.

373. SYRUPUS MORPHINÆ COMPOSITUS.

Compound Syrup of Morphine.

Fluid Extract of Ipecac	15 minims.
Fluid Extract of Senega	1½ fluidounces.
Fluid Extract of Rhubarb	120 minims.
Sulphate of Morphine	4 grains.
Oil of Sassafras	8 minims.
Syrup	enough to make 16 fluidounces.

Dissolve the Sulphate of Morphine in about *one* (1) *fluidounce* of Syrup, then add the Fluid Extracts and the Oil of Sassafras, and lastly, enough Syrup to make *sixteen* (16) *fluidounces.* Mix the whole thoroughly by shaking.

Note.—In some sections of the country, this preparation is dispensed, when

Pectoral Syrup or Jackson's Cough Syrup is demanded or ordered. As the formula differs too much from that originally used by Dr. Jackson (see Note to No. 376), it is recommended that the above preparation be dispensed only when it is designated by the title above given.

374. SYRUPUS MORPHINÆ SULPHATIS.

Syrup of Sulphate of Morphine.

Syrupus Morphinæ. Syrup of Morphine.

1. **Sulphate of Morphine**		16 grains.
Water		½ fluidounce.
Syrup	enough to make	16 fluidounces.

Dissolve the Sulphate of Morphine in the hot Water, and add enough Syrup to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains ⅛ grain of Sulphate of Morphine.

Note.—This preparation is in considerable use in the Southern States. It should, however, never be dispensed in prescriptions, unless it is known to be the preparation intended, or unless it is designated as that of the National Formulary (N. F.).

When *Syrup of Morphine* is prescribed without any such specific designation or knowledge, it is recommended that the corresponding, but weaker preparation of the French Pharm. be dispensed. The officinal title of this is *Sirop de Chlorhydrate de Morphine* (or *Sirop de Morphine*).

This may be prepared approximately of the strength required by the Codex, as follows:

2. **Hydrochlorate of Morphine**		5 grains.
Water		½ fluidounce.
Syrup	enough to make	16 fluidounces.

Dissolve the Hydrochlorate of Morphine in the Water, and add enough Syrup to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains about $\frac{1}{25}$ *grain of Hydrochlorate of Morphine.*

375. SYRUPUS PAPAVERIS.

Syrup of Poppy.

1. **Tincture of Poppy** (N. F.)		14 fluidounces.
Sugar		12 troy ounces.
Water	enough to make	16 fluidounces.

Evaporate the Tincture of Poppy, on a water-bath, at a gentle heat, until its volume is reduced to *seven* (7) *fluidounces.* In this dissolve the Sugar with a gentle heat, strain, and when the Syrup is cold, add enough Water to make *sixteen* (16) *fluidounces.*

Note.—The product is practically identical with the *Syrupus Papaveris* of the Brit. Pharm. The corresponding preparation of the Germ. Pharm. (*Syrupus Papaveris*, or *Syrupus Diacodii*) is much weaker, and may be prepared as follows:

2. **Tincture of Poppy** (N. F.)	2 fluidounces.
Syrup	14 “

Mix them.

376. SYRUPUS PECTORALIS.

Pectoral Syrup.

Jackson's Pectoral (or *Cough*) *Syrup.*

Hydrochlorate of Morphine	4 grains.
Oil of Sassafras	4 minims.
Syrup of Acacia	enough to make 16 fluidounces.

Dissolve the Hydrochlorate of Morphine in about *one* (1) *fluidounce* of the Syrup, add the Oil of Sassafras, and enough Syrup to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains $\frac{1}{32}$ *grain of Hydrochlorate of Morphine.*

Note.—The original formula of Dr. Samuel Jackson's Cough Syrup was as follows: Sassafras Pith, 60 grains; Acacia, 1 ounce; Sugar, 28 av. ounces; Muriate of Morphine, 8 grains; Water, enough to make 32 fluidounces. The Sassafras Pith was afterwards uniformly replaced by Oil of Sassafras, and the other constituents of the Syrup have been more or less altered, so that a number of different formulæ are in vogue in different sections of the country. It is recommended that the above be followed, if possible, for the sake of uniformity. (See Note to No. 373).

377. SYRUPUS PHOSPHATUM COMPOSITUS.

Compound Syrup of the Phosphates.

Chemical Food.

Precipitated Carbonate of Calcium	256 grains.
Phosphate of Iron (U. S. P. 1880)	128 "
Phosphate of Ammonium	128 "
Bicarbonate of Potassium	32 "
Bicarbonate of Sodium	32 "
Citric Acid	1 troy ounce.
Glycerin	1 fluidounce.
Phosphoric Acid (50%)	2 fluidounces.
Orange Flower Water	2 "
Tincture of Cudbear (N. F.)	120 minims.
Sugar	8 troy ounces.
Water	enough to make 16 fluidounces.

Triturate the Precipitated Carbonate of Calcium with the Bicarbonate of Potassium and Sodium, the Citric Acid, Glycerin, and Orange Flower Water, and gradually add the Phosphoric Acid, stirring until solution has been effected. Dissolve the Phosphate of Iron and the Phosphate of Ammonium in *four* (4) *fluidounces* of hot Water, cool, and add the solution to that previously prepared. Filter the whole through a pellet of absorbent cotton placed in the neck of a funnel, and receive the filtrate in a graduated bottle containing the Sugar. Agitate until the latter is dissolved, then add the Tincture of Cudbear, and lastly, enough Water to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains about 2 grains of Phosphate of Calcium, 1 grain, each, of the Phosphates of Iron and of Ammonium, and smaller quantities of the Phosphates of Potassium and Sodium.

378. SYRUPUS RHAMNI CATHARTICÆ.

Syrup of Rhamnus Cathartica.

Syrup of Buckthorn Berries. Syrupus Spinæ Cervinæ.

Sugar	13 troy ounces.
Fermented Juice of Buckthorn Berries,	enough to make 16 fluidounces.

Dissolve the Sugar in *seven* (7) *fluidounces* of the Juice, with the aid of a gentle heat, allow the Syrup to cool, then add enough of the Juice to make *sixteen* (16) *fluidounces*, and strain, if necessary.

Note.—This preparation is practically identical with that officinal in the *Germ. Pharm.* The species of Buckthorn to be used is the *Rhamnus cathartica* Linné, native of Europe, and naturalized, to some extent, in the U.S. If the fresh berries cannot be obtained, the imported fermented juice may be used in preparing the Syrup.

379. SYRUPUS RUBI AROMATICUS.

Aromatic Syrup of Blackberry.

Rubus (U. S. P.)	2 troy ounces.
Cinnamon	120 grains.
Nutmeg	120 "
Cloves	60 "
Allspice	60 "
Diluted Alcohol	a sufficient quantity.
Sugar	10 troy ounces.
Blackberry Juice	a sufficient quantity.

Reduce the Rubus (Blackberry Root) and the Aromatics to a moderately coarse (No. 40) powder, and percolate it, in the usual manner, with the Diluted Alcohol, until *four* (4) *fluidounces* of percolate are obtained. To this add *seven* (7) *fluidounces* of Blackberry Juice, and dissolve the Sugar in the liquid by agitation. Lastly, add enough Blackberry Juice to make *sixteen* (16) *fluidounces*.

380. SYRUPUS SANGUINARIÆ.

Syrup of Sanguinaria.

Syrup of Bloodroot.

Sanguinaria, in No. 20 powder	3½ troy ounces.
Acetic Acid	2 fluidounces.
Sugar	13 troy ounces.
Water	enough to make 16 fluidounces.

Mix the Acetic Acid with *six* (6) *fluidounces* of Water, moisten the Sanguinaria with a sufficient quantity of this menstruum, and allow it to macerate for two hours. Then pack it in a glass percolator, and percolate in the usual manner, first with the remainder of the menstruum previously prepared, and afterwards with Water until *twelve* (12) *fluidounces* of percolate are obtained, or until the Sanguinaria is practically exhausted. Evaporate the percolate, at a moderate heat, to *seven* (7) *fluidounces*. In this dissolve the Sugar with a gentle heat, if necessary, and add enough Water to make *sixteen* (16) *fluidounces*.

Each fluidrachm represents about 13 grains of Sanguinaria.

381. SYRUPUS SENNÆ AROMATICUS.

Aromatic Syrup of Senna.

Senna	2 troy ounces.
Jalap	384 grains.
Rhubarb	128 “
Cinnamon	30 “
Cloves	30 “
Nutmeg	15 “
Oil of Lemon	10 minims.
Sugar	12 troy ounces.
Diluted Alcohol	enough to make 16 fluidounces.

Reduce the drugs to a moderately fine (No. 50) powder, add to it the Oil of Lemon, and percolate it, in the usual manner, with Diluted Alcohol. Remove the first *eight* (8) *fluidounces* of the percolate, and dissolve in this the Sugar, with the aid of a gentle heat, if necessary, but avoiding loss of alcohol by evaporation. Allow the solution to cool, collect a further portion of percolate, and add it to the Syrup, so as to make *sixteen* (16) *fluidounces*.

Each fluidrachm represents 7½ grains of Senna, 3 grains of Jalap, and 1 grain of Rhubarb, with aromatics.

382. SYRUPUS SENNÆ COMPOSITUS.

Compound Syrup of Senna.

Fluid Extract of Senna	1024 minims.
Fluid Extract of Rhubarb	256 “
Fluid Extract of Frangula	256 “
Oil of Gaultheria	30 “
Alcohol	1 fluidounce.
Syrup	enough to make 16 fluidounces.

Dissolve the Oil of Gaultheria in the Alcohol, and add this to the mixed Fluid Extracts. Then add enough Syrup to make *sixteen* (16) *fluidounces*, and mix by agitation.

Each fluidrachm represents 8 grains of Senna, 2 grains of Rhubarb, and 2 grains of Frangula.

383. SYRUPUS SODII HYPOPHOSPHITIS.

Syrup of Hypophosphite of Sodium.

Hypophosphite of Sodium	256 grains.
Citric Acid	10 “
Sugar	12 troy ounces.
Water	enough to make 16 fluidounces.

Dissolve the Hypophosphite of Sodium and the Citric Acid in *eight* (8) *fluidounces* of Water, and filter the solution. In this dissolve the Sugar by agitation, and pass enough Water through the filter, to make the product measure *sixteen* (16) *fluidounces.*

Each fluidrachm contains 2 grains of Hypophosphite of Sodium.

384. SYRUPUS STILLINGIÆ COMPOSITUS.

Compound Syrup of Stillingia.

Compound Fluid Extract of Stillingia (N. F.)	4 fluidounces.
Purified Talcum	120 grains.
Sugar	11 troy ounces.
Water	enough to make 16 fluidounces.

Mix the Compound Fluid Extract of Stillingia with the Purified Talcum, and afterwards with *four and one-half* (4½) *fluidounces* of Water, and shake them together thoroughly. Then pour the mixture upon a wetted filter, add the Sugar to the filtrate, and pass enough Water through the filter to make the product, after the Sugar has been dissolved by agitation, measure *sixteen* (16) *fluidounces.*

Each fluidrachm represents 15 minims of Compound Fluid Extract of Stillingia (see No. 170).

385. TALCUM PURIFICATUM.

Purified Talcum.

Talcum, in fine powder	100 parts.
Hydrochloric Acid	15 “
Water	a sufficient quantity.

Mix *five hundred* (500) *parts* of boiling Water with the Talcum, gradually add *ten* (10) *parts* of the Hydrochloric Acid, and boil the mixture during fifteen minutes. Then allow the suspended Talcum to subside, pour off the supernatant liquid, and boil the residue again with *five hundred* (500) *parts* of Water mixed with the remainder of the Hydrochloric Acid. Again allow the mixture to become clear by settling, pour off the supernatant liquid, and wash the residue with Water, by repeated decantation, until a portion of the wash-water, filtered and placed in a test-tube, ceases to produce a precipitate with test-solution of nitrate of silver acidified with nitric acid. Then transfer the magma to a close linen or muslin strainer, allow it to drain, and dry it by heat.

Note.—Purified Talcum is used as an aid in filtering turbid liquids containing finely-divided matters in suspension, which are apt to pass through the filter, or to stop up its pores.

386. TINCTURÆ.

Tinctures.

General Process.—All Tinctures, for which no working formula is provided by the U. S. Pharmacopœia, the National Formulary, or some other work of authority, and the strength of which is not otherwise specified by the prescriber, should be prepared in the following proportions:

The Drug, properly comminuted	2 troy ounces.
The Menstruum	enough to make 16 fluidounces.

Note.—The choice of the menstruum will depend upon the nature of the drug, and in some cases upon the uses to which the Tincture is to be applied. In general, it may be stated that, if the useful constituents are soluble in alcohol, and but slightly, or not at all soluble in water, strong alcohol should be used as a menstruum. Whenever it is possible, and consistent with the intended use of the preparation, the alcoholic strength of the menstruum should be made to approach that of Diluted Alcohol, the object being not only to exhaust the Drug of all its useful constituents, but also to retain them in solution.

If the drug is fibrous and can be dried and powdered without injury or loss of useful constituents, percolation is preferable. If the drug is resinous and partly, or almost wholly soluble in the menstruum, or if it is fibrous, and cannot well be powdered without undergoing injury, maceration should be resorted to. In the latter case, the drug, comminuted as much as possible, should be kept in contact with the full quantity of the menstruum for two weeks, or until the soluble matters are extracted, the liquid portion strained off, and the remainder of the tincture contained in the residue on the strainer carefully displaced by washing with a fresh portion of the menstruum until 16 fluidounces of tincture are obtained for every 2 troy ounces of drug used in the operation.

The preparation of Tinctures from Fluid Extracts, instead of from the original drugs themselves, is not recommended. In some special cases, however, when the crude drug is not accessible, or when a tincture, which is not at hand and otherwise unobtainable, is required for immediate use, it may be prepared, extemporaneously, from the corresponding fluid extract, provided that the latter is known to fully represent the active constituents of the drug which are intended to be contained in the tincture (see formulas 387, 411, 412).

387. TINCTURA ACONITI, FLEMING.

Fleming's Tincture of Aconite.

1. Aconite (root), in fine powder	10 troy ounces.
Alcohol	enough to make 15 fluidounces.

Moisten the Aconite with enough Alcohol to render it distinctly damp and to maintain it so after twenty-four hours' maceration in a well covered vessel. Then pack it tightly in a percolator, and percolate it slowly, in the usual manner, with Alcohol, until *fifteen* (15) *fluidounces* of tincture are obtained.

Note.—This preparation is still prescribed by many physicians. It is recommended that their attention be directed to the officinal Fluid Extract and Tincture of Aconite, so that the above preparation may be gradually abandoned.

When this preparation is required for immediate use, and it is not otherwise available, it may be prepared in the following manner (see Note to No. 386):

2. **Fluid Extract of Aconite**	10 fluidounces.
Alcohol	5 "

Mix them.

388. TINCTURA AMARA.

Bitter Tincture.

Stomachic Tincture. Bitter Stomachic Drops. Stomach Drops.

Gentian	384 grains.
Centaury, herb	384 "
Bitter Orange Peel	256 "
Orange Berries	128 "
Zedoary, root	128 "
Alcohol, **Water,** each	enough to make 16 fluidounces.

Reduce the drugs to a moderately coarse (No. 40) powder, and percolate it, in the usual manner, with a mixture of *two* (2) *volumes* of Alcohol and *one* (1) *volume* of Water, until *sixteen* (16) *fluidounces* of percolate are obtained.

Note.—Centaury is the herb of *Erythræa Centaurium* Persoon. Orange Berries are the unripe fruit of *Citrus vulgaris* Risso, collected while small. Zedoary is the rhizome of *Curcuma Zedoaria* Roscoe. The product obtained by the above formula is practically identical with that which is officinal in the Germ. Pharm.

389. TINCTURA ANTACRIDA.

Antacrid Tincture.

Dysmenorrhœa Mixture. Fenner's Guaiac Mixture.

Corrosive Chloride of Mercury	40 grains.
Resin of Guaiac, in fine powder	2 troy ounces.
Canada Turpentine	2 " "
Oil of Sassafras	½ fluidounce.
Alcohol	enough to make 16 fluidounces.

Introduce the Resin of Guaiac and the Canada Turpentine into a flask, together with *twelve* (12) *fluidounces* of Alcohol, cork the flask loosely, and heat the contents, on a water-bath, slowly to boiling. Then cool the flask, and filter the contents through a small filter. Dissolve the Corrosive Chloride of Mercury in *one-half* (½) *fluidounce* of Alcohol, and add this solution, as well as the Oil of Sassafras, to the filtrate. Lastly, pass enough Alcohol through the filter to make the product measure *sixteen* (16) *fluidounces*.

Each fluidrachm contains nearly ⅓ grain of Corrosive Chloride of Mercury.

Note.—The dose of this preparation is about 10 to 20 minims.

390. TINCTURA ANTIPERIODICA.

Antiperiodic Tincture.

Warburg's Tincture.

1. *Without Aloes.*

Rhubarb		448 grains.
Angelica, seed		448 "
Elecampane		224 "
Saffron		224 "
Fennel		224 "
Gentian		112 "
Zedoary, root		112 "
Cubeb		112 "
Myrrh		112 "
White Agaric		112 "
Camphor		112 "
Sulphate of Quinine		1280 "
Diluted Alcohol	enough to make	8 pints.

Reduce the fibrous vegetable drugs to a coarse (No. 20) powder, mix this with the Myrrh and Camphor, previously powdered, and digest the whole, during twelve hours, in a suitable, well-covered vessel, with *seven* (7) *pints* of Diluted Alcohol, on a water-bath, avoiding, as much as possible, any loss of Alcohol by evaporation. Then strain off the liquid with pressure, dissolve the Sulphate of Quinine in the strained liquid, with a gentle heat, if necessary, filter, and pass enough Diluted Alcohol, first through the strainer and then through the filter, to make the product measure *eight* (8) *pints.*

Each fluidounce contains 10 grains of Sulphate of Quinine.

Note.—This preparation, made *without Aloes*, is intended to serve as a stock-tincture, from which the regular "Warburg's Tincture" is to be made, when required. "Warburg's Tincture without Aloes" is also often prescribed or asked for, and in this case, the above preparation is to be dispensed.

The original formula directed by Dr. Warburg contained the old *Confectio Damocratis* as one of the ingredients. This is a very complex preparation, many of the constituents of which are unobtainable at the present day. It has, therefore, been omitted.

2. *With Aloes.*

Aqueous Extract of Aloes	28 grains.
Antiperiodic Tincture, without Aloes	16 fluidounces.

Dissolve the Extract in the Tincture.

Note.—When "Warburg's Tincture," without any further specification, is ordered, this preparation (containing Aloes) is to be dispensed.

391. TINCTURA AROMATICA.

Aromatic Tincture.

Cinnamon (Cassia)	650 grains.
Ginger	260 "
Galangal, root	130 "
Cloves	130 "
Cardamom	130 "
Alcohol,	
Water, each . . . enough to make	16 fluidounces.

Reduce the drugs to a moderately coarse (No. 40) powder, and percolate it, in the usual manner, with a mixture of *two* (2) *volumes* of Alcohol and *one* (1) *volume* of Water, until *sixteen* (16) *fluidounces* of percolate are obtained.

Note.—This preparation is practically identical with that which is officinal in the Germ. Pharm. Galangal is the root of *Alpinia officinarum* Hance.

392. TINCTURA CAPSICI ET MYRRHÆ.

Tincture of Capsicum and Myrrh.

Hot Drops.

Capsicum, in No. 20 powder	½ troy ounce.
Myrrh, in moderately coarse powder	2 troy ounces.
Alcohol,	
Water, each . . . enough to make	16 fluidounces.

Mix the powders with an equal bulk of clean, fine sand, and percolate them, in the usual manner, with a mixture of *nine* (9) *volumes* of Alcohol, and *one* (1) *volume* of Water, until *sixteen* (16) *fluidounces* of percolate are obtained.

Note.—This preparation is known in some parts of this country by the old Thompsonian name "Number six."

393. TINCTURA CINCHONÆ DETANNATA.

Detannated Tincture of Cinchona.

Fluid Extract of Cinchona (U. S. P.)	3 fluidounces.
Alcohol	8 "
Solution of Tersulphate of Iron	6 "
Water of Ammonia	6 "
Water,	
Diluted Alcohol, each	a sufficient quantity.

To the Water of Ammonia, diluted with *twenty-four* (24) *fluidounces* of Water, gradually add the Solution of Tersulphate of Iron, previously diluted with *forty* (40) *fluidounces* of Water, under constant stirring. Pour this mixture, containing Ferric Hydrate as a precipitate, upon a wet muslin strainer (which has been tared, after having been wetted and deprived of the excess of water by moderate pressure), and when the liquid has drained off, return the precipitate to the vessel, and mix it intimately with about *sixty-four* (64) *fluidounces* of Water. Again drain it on the strainer, transfer it once more to the vessel, and treat it as before. Finally drain and press the precipitate on the strainer until it weighs *eight* (8) *troy ounces.*

Mix the Fluid Extract of Cinchona with *eight* (8) *fluidounces* of Alcohol, and add the Ferric Hydrate previously prepared. Agitate the mixture frequently, until the tincture is deprived of tannin, which may be known by the absence of a blackish-green color when a small portion of the clear tincture is treated with a drop or two of tincture of chloride of iron. Insert a plug of absorbent cotton into a suitable percolator, and introduce the mixture. As soon as the liquid has disappeared from the surface, pour on enough Diluted Alcohol to make the product measure *sixteen* (16) *fluidounces.*

Note.—This preparation is practically identical, in strength of Cinchona (without the tannin), with the officinal *Tinctura Cinchonæ.*

394. TINCTURA COTO.

Tincture of Coto.

Coto bark, bruised	2 troy ounces.
Alcohol	enough to make 16 fluidounces.

Macerate the Coto with *fourteen* (14) *fluidounces* of Alcohol during seven days; then pour off the liquid, press the residue, and filter the united liquids through paper. Lastly, wash the residue transferred to the filter with enough Alcohol to make the product measure *sixteen* (16) *fluidounces.*

Note.—Coto bark is derived from an undetermined tree, probably belonging to the natural order Lauraceæ, and is obtained from Bolivia. There are two varieties known, one as "Coto," and the other as "Paracoto" bark. True Coto bark is, at times, difficult to obtain in the market, and the Paracoto bark is then frequently substituted for it. While they possess some useful properties in common, yet they differ materially in other respects. Hence, the Paracoto bark should not be substituted for the true Coto bark.

395. TINCTURÆ ÆTHEREÆ.

Ethereal Tinctures.

General Formula.

The Drug, properly comminuted	2 troy ounces.
Alcohol,	
Stronger Ether, each	enough to make 16 fluidounces.

Percolate the Drug in the usual manner, but with proper precautions to avoid loss of menstruum by evaporation, with a mixture of *one* (1) *volume* of Stronger Ether, and *two* (2) *volumes* of Alcohol, until *sixteen* (16) *fluidounces* of percolate are obtained.

Note.—This formula is to be used, when Ethereal Tinctures of Belladonna, Castor, Digitalis, Lobelia, Valerian, or of other drugs, are to be prepared.

396. TINCTURA FERRI CHLORIDI ÆTHEREA.

Ethereal Tincture of Chloride of Iron.

Bestucheff's Tincture. Lamotte's Drops.

Solution of Chloride of Iron (U. S. P.)		350 minims.
Stronger Ether		4 fluidounces.
Alcohol	enough to make	16 fluidounces.

Mix the Solution of Chloride of Iron with *ten* (10) *fluidounces* of Alcohol, add the Stronger Ether, and lastly, enough Alcohol to make *sixteen* (16) *fluidounces*. Introduce the Tincture into bottles made of white (flint) glass, which should not be entirely filled. Cork them tightly and expose them to the rays of the sun, until the Tincture has been completely decolorized. Then remove the bottles to a shady place, and open them occasionally, until the contents have again assumed a yellow color. Lastly, transfer the tincture to bottles which should be well stoppered and kept in a cool and dark place.

Each fluidrachm represents about ½ grain of metallic Iron.

Note.—This preparation is practically identical with that which is officinal in the Germ. Pharm.

397. TINCTURA FERRI CITRO-CHLORIDI.

Tincture of Citro-Chloride of Iron.

Tasteless Tincture of Chloride of Iron. Tasteless Tincture of Iron.

Solution of Chloride of Iron (U. S. P.)		4 fluidounces.
Citrate of Sodium		7 troy ounces.
Alcohol		2¼ fluidounces.
Water	enough to make	16 "

Mix the Solution of Chloride of Iron with *four* (4) *fluidounces* of Water, and dissolve in this mixture the Citrate of Sodium with the aid of a gentle heat. Then add the Alcohol, and when the solution has become cold, make up the volume with water to *sixteen* (16) *fluidounces*. Set the product aside in a cold place for a few days, if convenient, so that the excess of saline matter may separate. Then filter, and pass enough cold Water through the filter to restore the original volume.

Each fluidrachm contains an amount of Iron equivalent to about 7½ grains of dry Chloride of Iron (ferric).

Note.—This preparation is practically identical in the strength of iron, but not in the quantity of alcohol, with the officinal *Tinctura Ferri Chloridi.*

398. TINCTURA FERRI POMATA.

Tincture of Ferrated Extract of Apples.

Tinctura Ferri Malatis Crudi. Tincture of Crude Malate of Iron.

Ferrated Extract of Apples		800 grains.
Alcohol		1½ fluidounces.
Cinnamon Water	enough to make	16 "

Dissolve the Ferrated Extract of Apples in *twelve* (12) *fluidounces* of Cinnamon Water, add the Alcohol, filter, and pass enough Cinnamon Water through the filter, to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents about ⅜ grain of metallic Iron.

Note.—This preparation is practically identical with that officinal in the Germ. Pharm. Ferrated Extract of Apples is the *Extractum Ferri Pomatum* (see No. 149).

399. TINCTURA GUAIACI COMPOSITA.

Compound Tincture of Guaiac.

Dewee's Tincture of Guaiac.

Resin of Guaiac	2	troy ounces.
Carbonate of Potassium	45	grains.
Pimenta, in moderately fine powder	240	“
Pumice, in fine powder	1	troy ounce.
Alcohol	7	fluidounces.
Water	8	“
Diluted Alcohol	enough to make 16	“

Triturate the Resin of Guaiac and Carbonate of Potassium, with the Pimenta and the Pumice, and afterwards gradually with the Alcohol. Next add slowly *seven* (7) *fluidounces* of cold Water and triturate the mixture thoroughly. Then filter, and pass enough Diluted Alcohol through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 7½ grains of Resin of Guaiac.

400. TINCTURA IODI, CHURCHILL.

Churchill's Tincture of Iodine.

Iodine	2½	troy ounces.
Iodide of Potassium	½	troy ounce.
Water	4	fluidounces.
Alcohol	enough to make 16	“

Dissolve the Iodide of Potassium in the Water, then add the Iodine, and lastly, enough Alcohol to make the Tincture, when completed, measure *sixteen* (16) *fluidounces.*

Note.—Churchill's Tincture of Iodine should not be confounded with Churchill's Iodine Caustic (*Liquor Iodi Causticus*, No. 222).

401. TINCTURA IODI DECOLORATA.

Decolorized Tincture of Iodine.

Iodine	610	grains.
Hyposulphite of Sodium	610	“
Water	1½	fluidounces.
Stronger Water of Ammonia (U. S. P.)	1	fluidounce.
Alcohol	enough to make 16	fluidounces.

Digest the Iodine, Hyposulphite of Sodium, and Water, at a gentle heat, until a perfect solution, of a dark reddish-brown color, is produced. Then add *two* (2) *fluidounces* of Alcohol, and afterwards, the Stronger Water of Ammonia. Shake a few minutes until no more bubbles of gas escape, and the liquid has become colorless, with a whitish precipitate (of sulphur) suspended in it. Cool it, if necessary, and add enough Alcohol to make *sixteen* (16) *fluidounces*. Place the bottle containing it in a refrigerator for a few hours, or longer, if convenient, then filter, in a covered funnel, and preserve the liquid for use.

Note.—On prolonged standing a crystalline precipitate of tetrathionate of sodium will usually form in the liquid. This may be removed by filtration.

402. TINCTURA JALAPÆ.

Tincture of Jalap.

Jalap, in fine powder	3 troy ounces.
Alcohol,	
Water, each	enough to make 16 fluidounces.

Mix *two* (2) *volumes* of Alcohol with *one* (1) *volume* of Water. Percolate the Jalap with this mixture, in the usual manner, until *sixteen* (16) *fluidounces* of Tincture are obtained.

Note.—This preparation was officinal in the U. S. P. of 1870.

403. TINCTURA JALAPÆ COMPOSITA.

Compound Tincture of Jalap.

Jalap, in fine powder	2 troy ounces.
Scammony, in powder	½ troy ounce.
Alcohol,	
Water, each	enough to make 16 fluidounces.

Mix *two* (2) *volumes* of Alcohol, with *one* (1) *volume* of Water. Mix the powders with half their weight of sand; moisten the mixture with a sufficient quantity of the menstruum, pack it in a percolator, and percolate it with the menstruum, in the usual manner, until *sixteen* (16) *fluidounces* of Tincture are obtained.

404. TINCTURA KINO COMPOSITA.

Compound Tincture of Kino.

Tincture of Kino	1½ fluidounces.
Tincture of Opium	1½ “
Spirit of Camphor	520 minims.
Oil of Cloves	10 “
Cochineal, in powder	64 grains.
Aromatic Spirit of Ammonia	60 minims.
Diluted Alcohol	enough to make 16 fluidounces.

Triturate the Cochineal with the Aromatic Spirit of Ammonia, and gradually add *eleven* (11) *fluidounces* of Diluted Alcohol. Then add the two Tinctures, the Spirit of Camphor, and the Oil of Cloves, and filter the mixture through paper. Lastly, pass enough Diluted Alcohol through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents about ½ grain, each, of Kino and of Powdered Opium.

405. TINCTURA PAPAVERIS.

Tincture of Poppy.

Poppy capsules, freed from seeds, and in coarse powder	8 troy ounces.
Glycerin	2 fluidounces.
Alcohol,	
Water, each	enough to make 16 fluidounces.

Digest the Poppy capsules with *three* (3) *pints* of boiling Water during two hours, then express and strain. Evaporate the strained liquid to *eight* (8) *fluidounces*, mix it with *four* (4) *fluidounces* of Alcohol, and set the mixture aside, well covered, until it is quite cold. Then filter, add the Glycerin to the filtrate, and pass enough of a mixture of *two* (2) *volumes* of Water and *one* (1) *volume* of Alcohol through the filter, to make the product measure *sixteen* (16) *fluidounces.*

Each fluidrachm represents 30 grains of Poppy (Capsule) freed from seeds.

406. TINCTURA PECTORALIS.

Pectoral Tincture.

Guttæ Pectorales. Pectoral Drops. Bateman's Pectoral Drops.

Tincture of Opium	320	minims.
Compound Tincture of Catechu	240	"
Spirit of Camphor	300	"
Oil of Anise	8	"
Caramel	120	"
Diluted Alcohol	enough to make	16 fluidounces.

Mix the first five ingredients with enough Diluted Alcohol to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 2½ minims of Tincture of Opium.

407. TINCTURA PERSIONIS.

Tincture of Cudbear.

Cudbear, in fine powder	2 troy ounces.
Alcohol,	
Water, each	enough to make 16 fluidounces.

Pack the Cudbear in a suitable percolator, and percolate it with a mixture of *one* (1) *volume* of Alcohol and *two* (2) *volumes* of Water, until *sixteen* (16) *fluidounces* of Tincture are obtained.

Note.—This preparation is intended as a coloring agent, when a bright-red tint or color is to be produced, particularly in acid liquids.

408. TINCTURA PERSIONIS COMPOSITA.

Compound Tincture of Cudbear.

Cudbear	120 grains.
Caramel	1½ troy ounces.
Alcohol,	
Water, each	enough to make 16 fluidounces.

Mix *one* (1) *volume* of Alcohol with *two* (2) *volumes* of Water. Macerate the Cudbear with *twelve* (12) *fluidounces* of the menstruum during twelve hours, agitating occasionally, and then filter through paper, and add the Caramel, previously dissolved in *two* (2) *fluidounces* of Water. Then pass enough of the before-mentioned menstruum through the filter to make the whole measure *sixteen* (16) *fluidounces*.

Note.—This preparation is intended as a coloring agent, when a brownish-red tint or color is to be produced.

409. TINCTURA PIMPINELLÆ.

Tincture of Pimpinella.

Pimpinella, root	2½ troy ounces.
Alcohol,	
Water, each	enough to make 16 fluidounces.

Mix *two* (2) *volumes* of Alcohol with *one* (1) *volume* of Water. Macerate the Pimpinella, reduced to a moderately coarse (No. 40) powder, with enough of the menstruum to keep it distinctly damp during twelve hours. Then percolate it with the same menstruum, in the usual manner, until *sixteen* (16) *fluidounces* of Tincture are obtained.

Note.—This preparation is approximately of the same strength as that which is officinal in the *Germ. Pharm.* Pimpinella root is derived from *Pimpinella Saxifraga* Linné, and *Pimpinella magna* Linné.

410. TINCTURA QUILLAJÆ.

Tincture of Quillaja.

Quillaja, in fine chips	8 troy ounces.
Alcohol	1 pint.
Water	enough to make 3 pints.

Place the Quillaja in a suitable vessel, with *two* (2) *pints* of Water, and boil it for fifteen minutes, then strain and add enough Water through the strainer to make the strained decoction, when cold, measure *two* (2) *pints*. Pour this into a bottle containing the Alcohol, let the mixture stand twelve hours, then filter it through paper, and add enough Water to the filtrate to make it measure *three* (3) *pints*.

Each fluidrachm represents 10 grains of Quillaja.

Note.—This preparation, aside from its therapeutic use, may be employed as an emulsifying agent for oils, balsams, resins. (See Note to No. 114, IV. "Quillaja Emulsion of Cod Liver Oil," page 40.)

411. TINCTURA RHEI AQUOSA.

Aqueous Tincture of Rhubarb.

1. Rhubarb		720	grains.
Borate of Sodium		72	"
Carbonate of Potassium		72	"
Cinnamon Water		2	fluidounces.
Alcohol		1¾	"
Water	enough to make	16	"

Dissolve the Borate of Sodium and the Carbonate of Potassium in *twelve* (12) *fluidounces* of Water, and macerate in this solution, during twenty-four hours, the Rhubarb, cut into thin slices and carefully freed from any adhering fine powder. Then strain it through muslin, heat the strained liquid to boiling, add the Cinnamon Water and Alcohol, stir it well and filter, while warm, in a covered funnel. To the cold filtrate add enough Water to make the product measure *sixteen* (16) *fluidounces.*

Each fluidrachm represents about 5⅔ grains of Rhubarb.

Note.—The product is practically identical with that obtained by the process of the Germ. Pharm., in which this preparation is officinal. It is liable to deteriorate when kept too long, and should not be prepared in larger quantity than may be consumed within a short time.

When this preparation is required for immediate use, and it is not otherwise obtainable, it may be prepared in the following manner:

2. Fluid Extract of Rhubarb		720	minims.
Borate of Sodium		72	grains.
Carbonate of Potassium		72	"
Cinnamon Water		2	fluidounces.
Alcohol		1¾	"
Water	enough to make	16	"

Dissolve the Borate of Sodium and the Carbonate of Potassium in about *eight* (8) *fluidounces* of Water. Add the Cinnamon Water, Alcohol, and Fluid Extract of Rhubarb, and lastly, enough Water to make the product measure *sixteen* (16) *fluidounces.* Filter, if necessary.

412. TINCTURA RHEI ET GENTIANÆ.

Tincture of Rhubarb and Gentian.

1. Rhubarb		512	grains.
Gentian		128	"
Diluted Alcohol	enough to make	16	fluidounces.

Reduce the solids to a moderately coarse (No. 40) powder, and percolate it, in the usual manner, with Diluted Alcohol, until *sixteen* (16) *fluidounces* of percolate are obtained.

Each fluidrachm represents 4 grains of Rhubarb and 1 grain of Gentian.

Note.—When this preparation is required for immediate use, and it is not otherwise obtainable, it may be prepared in the following manner:

2. **Fluid Extract of Rhubarb**		512 minims.
Fluid Extract of Gentian		128
Diluted Alcohol	enough to make	16 fluidounces.

Mix the Fluid Extracts with enough Diluted Alcohol to make *sixteen* (16) *fluidounces*, and filter.

413. TINCTURA RHEI VINOSA.

Vinous Tincture of Rhubarb.

Fluid Extract of Rhubarb		600 minims.
Fluid Extract of Bitter Orange Peel		150 "
Tincture of Cardamom		600 "
Sugar		2 troy ounces.
Sherry Wine	enough to make	16 fluidounces.

Mix the Fluid Extracts and the Tincture with *eight* (8) *fluidounces* of Sherry Wine. In this dissolve the Sugar by agitation, then add enough Sherry Wine to make *sixteen* (16) *fluidounces*, and filter.

Note.—This preparation corresponds, in strength, to that which is official in the Germ. Pharm.

414. TINCTURA SAPONIS VIRIDIS COMPOSITA.

Compound Tincture of Green Soap.

Green Soap		2¼ troy ounces.
Oil of Cade		140 minims.
Alcohol	enough to make	16 fluidounces.

Dissolve the Green Soap in *twelve* (12) *fluidounces* of Alcohol, add the Oil of Cade, and then enough Alcohol to make the product measure *sixteen* (16) *fluidounces*, and filter.

415. TINCTURA STROPHANTHI.

Tincture of Strophanthus.

Strophanthus seeds, freed from their comose appendage, reduced to No. 30 powder, and dried at 50° C (122° F.)		1 troy ounce.
Stronger Ether		a sufficient quantity.
Alcohol	enough to make	20 fluidounces.

Pack the Strophanthus in a suitable percolator, pour on enough Stronger Ether to saturate the powder thoroughly, cover the percolator and macerate during twenty-four hours. Then allow the percolation to proceed, gradually pouring on Stronger Ether, until the liquid passes through colorless. This ethereal percolate is to be rejected. Remove the marc from the percolator, and dry it, first by exposure to air, and then at a temperature of 50° C. (122° F.).

Again reduce it to powder, moisten it with Alcohol, repack it in the percolator, and macerate during forty-eight hours. Then percolate it with Alcohol, in the usual manner, until *twenty* (20) *fluidounces* of Tincture are obtained.

Each fluidrachm represents 3 grains of Strophanthus. The dose is about 2 to 10 minims.

Note.—Strophanthus seeds are obtained from one or more species of *Strophanthus* growing in Eastern Africa, and are usually referred to *Strophanthus Kombé* Oliver.

416. TINCTURA TOLUTANA SOLUBILIS.

Soluble Tincture of Tolu.

Balsam of Tolu	1½ troy ounces.
Carbonate of Magnesium	60 grains.
Glycerin	6 fluidounces.
Water,	
Alcohol, each . . . enough to make	16 fluidounces.

Mix *three* (3) *fluidounces* of Alcohol with the Glycerin, and dissolve the Balsam of Tolu in the mixture with the aid of heat, avoiding loss by evaporation. Next add *six* (6) *fluidounces* of Water, and allow the mixture to become cold. Pour off the milky liquid from the resinous precipitate (which latter is to be rejected), mix it with the Carbonate of Magnesium by trituration, and filter. Lastly, pass enough of a mixture of *one* (1) *volume* of Alcohol and *two* (2) *volumes* of Water through the filter, to make the whole filtrate measure *sixteen* (16) *fluidounces*.

Note.—This preparation may be added to Syrup or Water without producing cloudiness. A mixture of 1 fluidounce of this preparation with 15 fluidounces of Syrup yields a product which may be used as Syrup of Tolu in all cases where the officinal preparation is not required.

417. TINCTURA VANILLINI COMPOSITA.

Compound Tincture of Vanillin.

Compound Essence of Vanillin.

Vanillin	45 grains.
Cumarin	3 “
Alcohol	3 fluidounces.
Glycerin	2 “
Syrup	2 “
Compound Tincture of Cudbear (N. F.)	120 minims.
Water . . . enough to make	16 fluidounces.

Dissolve the Vanillin and Cumarin in the Alcohol, add the Glycerin, Syrup, and Compound Tincture of Cudbear, and lastly, enough Water to make *sixteen* (16) *fluidounces*.

418. TINCTURA ZEDOARIÆ AMARA.

Bitter Tincture of Zedoary.

Compound Tincture of Zedoary.

Zedoary, root	4 troy ounces.
Aloes	2 " "
Rhubarb	1 troy ounce.
Gentian	1 " "
White Agaric	1 " "
Saffron	1 " "
Glycerin	2 fluidounces.
Alcohol,	
Water, each	enough to make 16 "

Reduce the solids to a moderately coarse (No. 40) powder, moisten this with a sufficient quantity of a mixture of *two* (2) *volumes* of Alcohol and *one* (1) *volume* of Water, and percolate it in the usual manner, with this menstruum, until *twelve* (12) *fluidounces* of percolate are obtained. Add to this the Glycerin and set it aside. Then continue the percolation, until the drugs are practically exhausted, evaporate the new percolate to *two* (2) *fluidounces* and add it to the reserved portion.

Each fluidrachm represents 15 grains of Zedoary, 7½ grains of Aloes, and 3¾ grains, each, of the other drugs.

Note.—The above preparation is not identical with the *Tinctura Zedoariæ Composita* (also known as *Tinctura Carminativa, Tinctura Wedelii*) which was formerly officinal in some continental pharmacopœias.

419. UNGUENTUM CALAMINÆ.

Calamine Ointment.

Unguentum Zinci Carbonatis (Impuri). Unguentum Calaminare.
Turner's Cerate.

Prepared Calamine	1 part.
Ointment (U. S. P.)	5 parts.

Mix them intimately, by trituration, so as to produce a smooth and homogeneous ointment.

420. UNGUENTUM CAMPHORÆ.

Camphor Ointment.

Unguentum Camphoratum.

Camphor, in coarse powder	2 parts.
White Wax	1 part.
Lard	6 parts.

Melt the White Wax and Lard with a gentle heat, then add the Camphor, and stir the Ointment until it is cold.

421. UNGUENTUM FUSCUM.

Brown Ointment.

Unguentum Matris. Mother's Salve.

Camphorated Brown Plaster (N. F.)	2 parts.
Olive Oil	1 part.
Suet	1 "

Melt them together, and stir the mass until it is cold.

422. UNGUENTUM PICIS COMPOSITUM.

Compound Tar Ointment.

Oil of Tar	4 parts.
Tincture of Benzoin	2 "
Oxide of Zinc	3 "
Yellow Wax	26 "
Lard	32 "
Cotton Seed Oil	35 "

Melt the Yellow Wax and Lard with the Cotton Seed Oil at a gentle heat. Add the Tincture of Benzoin, and continue heating until all the Alcohol has evaporated. Then withdraw the heat, add the Oil of Tar, and finally the Oxide of Zinc, incorporating the latter thoroughly, so that on cooling, a smooth, homogeneous ointment may result.

423. UNGUENTUM SULPHURIS COMPOSITUM.

Compound Sulphur Ointment.

Wilkinson's Ointment. Hebra's Itch Ointment.

Precipitated Carbonate of Calcium	10 parts.
Sublimed Sulphur	15 "
Oil of Cade	15 "
Green Soap	30 "
Lard	30 "

Mix the Lard with the Green Soap and Oil of Cade. Then gradually incorporate the Sublimed Sulphur and Precipitated Carbonate of Calcium.

424. VINUM AURANTII.

Wine of Orange.

Oil of Bitter Orange	6 minims.
Alcohol	60 "
Purified Talcum	120 grains.
Sherry Wine	enough to make 16 fluidounces.

Triturate the Purified Talcum, first with the Alcohol, in which the Oil of Bitter Orange had previously been dissolved, and afterwards with *twelve* (12) *fluidounces* of Sherry Wine, gradually added. Filter the mixture through a wetted filter, returning the first portions of the filtrate until it runs through clear, and lastly, pass enough Sherry Wine through the filter to make *sixteen* (16) *fluidounces.*

425. VINUM AURANTII COMPOSITUM.

Compound Wine of Orange.

Elixir Aurantiorum Compositum (Germ. Pharm.). *Compound Elixir of Orange.*

Bitter Orange Peel		1600 grains.
Absinthium		480 "
Menyanthes, leaves		480 "
Cascarilla		480 "
Cinnamon (Cassia)		320 "
Gentian		320 "
Carbonate of Potassium		80 "
Sherry Wine	enough to make	16 fluidounces.

Reduce the six first-named drugs to a moderately coarse (No. 40) powder, mix with this the Carbonate of Potassium, moisten the mixture with Sherry Wine, and let it macerate during twenty-four hours. Then pack it in a percolator, and percolate with Sherry Wine, in the usual manner, until *sixteen* (16) *fluidounces* of product are obtained.

Note.—The Germ. Pharm. directs to macerate the Orange Peel, Cinnamon and Carbonate of Potassium with the Sherry Wine, and then to add the other drugs in form of extracts. The proportions above given produce a product practically identical with that of the Germ. Pharm.

426. VINUM CARNIS.

Wine of Beef.

Beef and Wine.

Extract of Beef		256 grains.
Hot Water		1 fluidounce.
Sherry Wine	enough to make	16 fluidounces.

Pour the Hot Water upon the Extract of Beef contained in a mortar or other suitable vessel, and triturate until a smooth mixture results. Then gradually add, while stirring, *fourteen* (14) *fluidounces* of Sherry Wine. Transfer the mixture to a bottle, set this aside for a few days in a cold place, if convenient, then filter, and pass enough Sherry Wine through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 2 grains of Extract of Beef.

Note.—The Extract of Beef suitable for this or similar preparations is that which is prepared by Liebig's method.

427. VINUM CARNIS ET FERRI.

Wine of Beef and Iron.

Beef, Wine and Iron.

Extract of Beef	256 grains.
Tincture of Citro-Chloride of Iron	256 minims.
Hot Water	1 fluidounce.
Sherry Wine . . . enough to make	16 fluidouncces.

Pour the Hot Water upon the Extract of Beef contained in a mortar or other suitable vessel, and triturate until a smooth mixture results. Then gradually add, while stirring, *twelve* (12) *fluidounces* of Sherry Wine. Next add the Tincture and enough Sherry Wine to make *sixteen* (16) *fluidounces.* Transfer the mixture to a bottle, set this aside for a few days in a cold place, if convenient, filter, and pass enough Sherry Wine through the filter to restore the original volume.

Each fluidrachm represents 2 grains of Extract of Beef, and 2 minims of Tincture of Citro-Chloride of Iron.

Note.—Regarding Extract of Beef, see Note to No. 426.

428. VINUM CARNIS, FERRI ET CINCHONÆ.

Wine of Beef, Iron and Cinchona.

Beef, Wine, Iron and Cinchona.

Extract of Beef	256 grains.
Tincture of Citro-Chloride of Iron	256 minims.
Sulphate of Quinine	16 grains.
Sulphate of Cinchonidine	8 "
Citric Acid	6 "
Hot Water	1 fluidounce.
Angelica Wine . . . enough to make	16 fluidounces.

Dissolve the Citric Acid and the Sulphates of Quinine and Cinchonidine in the Hot Water, and pour the solution upon the Extract of Beef contained in a mortar, or other suitable vessel. Triturate the liquid with the Extract, until they form a smooth mixture, then gradually add, while stirring, *twelve* (12) *fluidounces* of Angelica Wine, and afterwards the Tincture of Citro-Chloride of Iron. Transfer the mixture to a bottle, set this aside for a few days in a cold place, if convenient, filter, and pass enough Angelica Wine through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 2 grains of Extract of Beef, 2 minims of Tincture of Citro-Chloride of Iron, and small quantities of Cinchona alkaloids.

Note.—Regarding Extract of Beef, see Note to No. 426. Angelica Wine is a variety of sweet California wine.

429. VINUM ERYTHROXYLI.

Wine of Erythroxylon.

Wine of Coca.

Fluid Extract of Erythroxylon		1 fluidounce.
Alcohol		1 “
Sugar		1 troy ounce.
Claret Wine	enough to make	16 fluidounces.

Dissolve the Sugar in about *ten* (10) *fluidounces* of Claret Wine, add the Alcohol and Fluid Extract, and enough Claret Wine to make *sixteen* (16) *fluidounces*. Let the mixture stand a few days in a cold place, if convenient, then filter and pass enough Claret Wine through the filter, to restore the original volume.

Each fluidounce represents 30 grains of Erythroxylon (*Coca*).

Note.—In place of Claret Wine, any other palatable wine may be used, according to the demand or preference of the prescriber or consumer.

430. VINUM ERYTHROXYLI AROMATICUM.

Aromatic Wine of Erythroxylon.

Aromatic Wine of Coca.

Fluid Extract of Erythroxylon		1	fluidounce.
Compound Elixir of Taraxacum		60	minims.
Syrup of Coffee		180	“
Port Wine		2½	fluidounces.
Aromatic Elixir		4½	“
Sherry Wine	enough to make	16	“

Mix the five first-named ingredients with *seven* (7) *fluidounces* of Sherry Wine. Let the mixture stand several days in a cold place, if convenient, then filter, and pass enough Sherry Wine through the filter to make the product measure *sixteen* (16) *fluidounces*.

Each fluidounce represents 30 grains of Erythroxylon (*Coca*).

431. VINUM FRAXINI AMERICANÆ.

Wine of White Ash.

Fraxinus (bark) in No. 40 powder		8 troy ounces.
Stronger White Wine (U. S. P.)	enough to make	16 fluidounces.

Moisten the powdered Fraxinus with *sixteen* (16) *fluidounces* of Stronger White Wine, macerate it during three days in a well covered vessel, then pack it in a percolator, and gradually pour on Stronger White Wine, until *sixteen* (16) *fluidounces* of percolate are obtained. Keep the product in well-stoppered bottles, which should be completely filled, and stored in a cool place.

Each fluidrachm represents 30 grains of Fraxinus (*bark*).

Note.—Fraxinus bark is the inner bark of the trunk or root of *Fraxinus Americana* Linné (White Ash).

432. VINUM PEPSINI.

Wine of Pepsin.

Pepsin (N. F.)	128 grains.
Glycerin	360 minims.
Hydrochloric Acid	30 "
Water	1 fluidounce.
Purified Talcum	120 grains.
Stronger White Wine (U. S. P.)	enough to make 16 fluidounces.

Mix the Water, Glycerin and Hydrochloric Acid, and agitate the Pepsin with the mixture until it is completely disintegrated and apparently dissolved. Then add enough Stronger White Wine to make *sixteen* (16) *fluidounces*, mix the liquid intimately with the Purified Talcum, allow it to stand for a week, if convenient, frequently shaking, then filter, and pass enough Stronger White Wine through the filter to restore the original volume.

Each fluidrachm represents 1 grain of Pepsin (*N. F.*).

433. VINUM PICIS.

Wine of Tar.

Tar	1½ troy ounces.
Water	4 fluidounces.
Pumice, in moderately fine powder	2 troy ounces.
Stronger White Wine	enough to make 16 fluidounces.

Upon the Tar contained in a suitable vessel pour *four* (4) *fluidounces* of cold Water, and triturate the mixture thoroughly; then pour off the Water and throw it away. Mix the remaining Tar thoroughly with the powdered Pumice, and add *sixteen* (16) *fluidounces* of Stronger White Wine. Stir frequently during four hours, then transfer the mixture to a wetted filter, and, after the liquid has passed, pour on enough Stronger White Wine to make the filtrate measure *sixteen* (16) *fluidounces*.

434. VINUM PRUNI VIRGINIANÆ.

Wine of Wild Cherry.

Wild Cherry, in No. 40 powder	4 troy ounces.
Sugar	2½ " "
Water	3 fluidounces.
Alcohol	1 fluidounce.
Purified Talcum	120 grains.
Angelica Wine	enough to make 16 fluidounces.

Dissolve the Sugar in the Water. Moisten the Wild Cherry with a sufficient quantity of this solution, and allow it to macerate during one hour. Then transfer it to a percolator, pour upon it the remainder of the solution, and afterwards, enough Angelica Wine until *fifteen* (15) *fluidounces* of percolate are obtained. Add to this the Alcohol, mix the Purified Talcum intimately with the liquid, then filter, returning the first portions of the filtrate until it runs through clear, and finally pass enough Angelica Wine through the filter, to make the product measure *sixteen* (16) *fluidounces.*

Each fluidrachm represents 15 grains of Wild Cherry.

435. VINUM PRUNI VIRGINIANÆ FERRATUM.

Ferrated Wine of Wild Cherry.

Tincture of Citro-Chloride of Iron		640 minims.
Wine of Wild Cherry	enough to make	16 fluidounces.

Mix the Tincture with enough Wine of Wild Cherry to make *sixteen* (16) *fluidounces.*

Each fluidrachm represents 5 minims of Tincture of Citro-Chloride of Iron and 13¾ *grains of Wild Cherry.*

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